

# A GOLD MINE ON YOUR FARM



Buffalo, N.Y.

## Men Are Four.

He who knows not, and knows not he knows not; he is a fool, shun him. He who knows not, and knows he knows not; he is simple, teach him. He who knows, and knows not he knows; he is asleep, wake him. He who knows, and knows he knows; he is wise, follow him.

—Arab Proverb.

We Claim to Know the  
Spraying Business.

*The* EDITH *and* LORNE PIERCE  
COLLECTION *of* CANADIANA



*Queen's University at Kingston*

*Let's talk of Worms, Bugs and Parasites, and how to kill 'em.*

# A GOLD MINE ON YOUR FARM



THE SPRAMOTOR  
COMPANY,

LONDON,  
Canada.

1902.

BUFFALO,  
New York.

## THE SEAL OF CERTAINTY.



This symbol stands for certainty as against chance in purchasing.

It is as significant as the seal on a document.

It constitutes a direct guarantee of reliable workmanship, or your money back, from the makers.

The name of SPRAMOTOR means that the retailer's profit is limited, and that you, and not he alone, shall benefit by the exceptional value we put in each machine.

We protect your interest for our own sake. We make every purchaser a SPRAMOTOR enthusiast.



MR. GEO. E. FISHER, GOVERNMENT CHIEF INSPECTOR,  
SPRAYING FOR THE DESTRUCTION OF SAN JOSE SCALE.



Awarded Gold Medal at Pan-American Exhibition, 1901, at Buffalo, N. Y.

Highest Award at Toronto, London, Ottawa, Halifax, 1900.

Over One Hundred Highest Awards throughout the world have been granted to the Spramotor.

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# A GOLD MINE ON YOUR FARM.

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Why seek newer climes and unbeaten paths to search for earth's treasures when a gold mine lies at your very door?

A mine that requires no delving in the earth's bosom. A mine that's yours for the asking.

It is in evidence everywhere—in the orchard, in the fields, in the vineyard, and in the garden.

It represents the difference between what your trees and plants have yielded and what they can be induced to yield under the magic touch of the SPRAMOTOR.

What is the Spramotor?

It is a machine that has demonstrated to the satisfaction of the Department of Agriculture that over 80% of the possible fruit crop of the country is going to waste, and all through a lack of appreciation on the part of the growers of proper means of saving it.

Startling as this may seem, it is backed up by convincing details. On the pages that follow will be found the reports.

From five apple orchards where the Spramotor was used the yield was 2,977 barrels of perfect fruit out of a possible 3,400 barrels. This was equal to 87¼%.

On the other hand, where the orchards were not sprayed the returns were most disappointing. Out of a total of 3,400 barrels only 380 barrels were good, or exactly 11.17%.

The total number of trees sprayed during the year was 600. The average yield of the trees sprayed was two barrels to a tree. The apples sold at an average of \$2.50 per barrel, making a total of \$2,816.

The average yield for the trees unsprayed was ½ barrel, or 300 barrels in all. Of these only 11⅓%, or 33½ barrels were firsts, at \$2.50 a barrel. These totalled only \$83.75, leaving a clear gain in favor of the sprayed trees of \$2,534.25.

Throughout this experiment no estimate of second class fruit was made in either case.

By applying this gain proportionately to the estimated total of 6,250,000 bearing apple trees in the Province of Ontario, we have the startling returns of \$27,265,625 from sprayed fruit against \$872,395 from the unsprayed.

There you have it—the gold mine—or a difference of \$26,393,230, which can be saved to the people of Ontario by the use of the Spramotor.

Doubtless you have done some spraying. But if you have failed to spray with the Spramotor you have wasted a lot of time and effort, which could have been devoted to other purposes.

The Spramotor is not an iron pump. It is a well constructed machine. Its bearings and other parts likely to be subject to the influence of copper mixtures are all of brass, an improvement which extends the usefulness of the apparatus many years.

The Spramotor is a practicable machine for practical purposes. It can be put to a number of uses, saving its cost a dozen times over in the course of a season.

Used for spraying fruit trees, shrubs and vines it increases the yield over 80%.

Under its influence, row crops are rid of grubs, worms, bugs and other pests.

For killing wild mustard in the growing grain its value is beyond computation.

For relieving live stock from the annoyance of the horn fly it demonstrates its usefulness many times over, and assures a greater yield of milk and butter.

For disinfecting its effectiveness is unquestioned.

For painting and whitewashing out-houses, barns, fences, etc., it is a money-maker, because it is a money-saver. It covers a given area in 1/20th the time required by hand labor. Used with Spramotor Cold Water Paint it reduces the expense of painting fully 60%.

For spraying trees in cold weather the Spramotor guarantees an accurate percentage of oil. This has been the stumbling block with other machines.

The disposition of the oil in the mixture to chill needs to be overcome. It is in the Spramotor. Neither can the oil and the water separate in the delivery pipe as in other machines.

Spramotor is a word coined by us for trade mark purposes. Its presence on the apparatus is a guarantee of reliability. It is a positive sign that as far as workmanship and material are concerned it surpasses any machine of its kind on the market.

It is to your interest to secure the best. The time you'll lose in repairing inferior apparatus and the cash you'll lose through imperfect spraying will exceed the cost of the Spramotor a hundred times in the first season.

According to Experimentors and Entomologist of the Experimental Farms "about 90% of the spraying done is not spraying at all. That is why the entomologists have always gotten good results from spraying while some fruit growers haven't."

The Canadian Government set its seal of approval on the Spramotor, declaring it to be the best invention of its kind. In the official test of eleven spraying machines at Grimsby, the Spramotor won first place with fitting honors. Its superiority over all the others was so pronounced that the official report could have been written, in all truthfulness, "Spramotor first, the rest nowhere."

The Pan American Gold Medal, and highest awards have been given to the makers wherever the Spramotor has been shown. These merely show how competent judges look on it.

The more flattering endorsements come from the men of the fields and vineyards—the practical workaday class.

And yet its utility is not confined to the farm.

As a machine for painting and whitewashing it has earned its cost many times over. Testimonials from brewers, manufacturers and heads of other large institutions in the United States and Canada refer to it as being indispensable. Why not, therefore, join the army of Spramotor users? It's to your profit. The gold mine is yours.



KNAPSACK SPRAMOTOR SHOWING THE SPRAYING OF  
BUSHES AND SHRUBS.



# TREATISE

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## DISEASES AFFECTING FRUIT TREES, VEGETABLES, ETC. AND THEIR REMEDIES.

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### Results of Spraying.

[BULLETIN 44.]

HATCH EXP. STATION.

The results of spraying during the past season, to protect crops from insects and fungus pests, again show the great benefits derived from this work. All of the fruit and vegetable crops grown on the College grounds, generally injured by the above pests, were treated according to the spraying calendar of 1896, and in most cases with marked beneficial results, only one illustration of which will be offered.

Four Baldwin and five R. I. Greening apple trees were selected: three of the former and four of the latter variety were sprayed; leaving as a check one tree of each kind.

RESULTS.—The trees sprayed gave results as follows: Baldwin, 3.37% more picked apples; 16% less windfalls; 50% less wormy fruit, and 93% less scabby fruit than the unsprayed trees. R. I. Greening 100% more picked fruit; 49% less windfalls; 81% less wormy fruit, and 72% less scabby fruit.

Equally good results were obtained from many other kinds of fruits.

[BULLETIN 37.]

HATCH EX. STATION.

All the trees in the Station orchard, except those omitted for checks, were sprayed according the scheme proposed in the spraying calendar in Bulletin No. 29, of May, 1895, the results of which are illustrated in an experiment with five R. I. Greenings. The trees were eighteen years old, of a vigorous growth, and produced a heavy crop of apples. They were sprayed as follows:

Nos. 1, 2, 4 and 5, April 10, Bordeaux mixture.

Nos. 1, 2, 4 and 5, May 8, Bordeaux mixture and Paris Green, 1 pound to 100 gallons.

Nos. 1, 2, 4 and 5, May 22, Bordeaux mixture and Paris Green, 1 pound to 100 gallons.

Nos. 1, 2, 4 and 5, June 8, Bordeaux mixture and Paris Green, 1 pound to 100 gallons.

Nos. 1 and 2, July 23, Bordeaux mixture.

Nos. 1 and 2, August 8, ammoniacal carb. of copper.

No. 3 was left unsprayed.

The following table shows the result of spraying R. I. Greenings:

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#### DEPARTMENT OF AGRICULTURE, ONTARIO.

Mr. W. H. Heard,

Manager of Spramotor Co.

Dear Sir,

Toronto, Ont., Aug. 28th, 1896.

I have great pleasure in stating that the Spramotor ordered from your Company this season has given entire satisfaction. It works easily, and is very effective in its operation. Your Company deserves much credit for placing so excellent a pump on the market.

Yours very truly,

JNO. DRYDEN,  
Minister of Agriculture.



VARIETY	Sprayed	Picked Fruit.	Windfalls	Per Cent. Wormy.	Per Cent. Scabby
No. 1.....	6 times	8½ bus.	3½ bus.	6	2
No. 2.....	6 times	13½ "	4½ "	7	5
No. 3.....	0 times	2 "	4½ "	55	100
No. 4.....	4 times	7 "	4¼ "	20	15
No. 5.....	4 times	8 "	5½ "	12	20

All through the season the foliage of the sprayed tree was of a darker green color, was very much less injured by leaf-eating insects and fungi, and was longer retained than that of the unsprayed trees. The fruit was examined critically at picking for quality and freedom from insect or fungus attack. The results, however, in the Station orchard, and in many commercial orchards of the State, make it certain that we cannot be sure of good fruit without the proper use of insecticides and fungicides.

Experiments by Prof. John Craig, of the Dominion Experimental Farm, during 1895, showing average results from the use of the main insecticides, which are very interesting.

"It will be seen that there is considerable variation in the results obtained in the treatment of individual trees. The average percentage of wormy fruit, however, stands as follows :

Arsenate of Lead and Bordeaux mixture....	2.15
Arsenate of Lead.....	5.60
Paris Green .....	6.38
Paris Green and Bordeaux mixture.....	6.64
Bordeaux mixture.....	7.46
Unsprayed.....	14.45

Although the value of the insecticides applied in the form of spray for the prevention of codling moth has long been demonstrated by the entomological division, the additional evidence brought out thus incidentally affords some satisfaction."

*(From the "Farmer's Advocate.")*

The success was marked on the orchard of Mr. Ralph S. Eaton, of Kentville. The trees used in conducting the experiment were Gravenstein. He began early in the season and sprayed carefully and thoroughly, making five applications in all, but allowing one row to remain unsprayed. In every other respect the trees received the same treatment, the land being plowed and cultivated in identically the same way and at the same time. At the end of the season the difference between the sprayed and unsprayed fruit was so marked that it could be easily noticed in walking through the orchard. The writer visited the orchard when these apples were being gathered, and took photographs of a half-bushel of fruit from the unsprayed row, and another lot from an adjoining sprayed row (see cuts). The apples photographed were average baskets as the men picked them from the trees, without any sorting whatever, and the men had no previous knowledge

#### ONTARIO AGRICULTURAL COLLEGE.

Guelph, Canada, Aug. 24th, 1899.

The Spramotor Co., London, Ont.:

Dear Sirs,—I can with pleasure say a good word in behalf of your Spramotor outfits. I have noted with interest the improvements made in them from time to time, and I think you deserve credit for the enterprise you have shown in making them strictly first-class.

We are using both your large and small sized outfits, and they are giving excellent satisfaction. Your latest improvements, the Spramotor Jr.'s, Nos. 1 and 2, are all that could be desired, and I can heartily recommend them to all who have spraying to do.

Yours truly,

H. L. HUTT.



SPRAYED APPLES.



UNSPRAYED APPLES.

as to what use was to be made of them, so that they were absolutely fair samples. The fruit was piled on the ground in such a way as to show every blemish caused by black spot in both samples, though in the case of the unsprayed lot there were so many apples thus injured, that it was almost impossible to have them all shown. Where one man sprays his own orchard and the other does not, if results favor the former, such results are always open to the suspicion that there was some other difference, aside from the spraying, which was responsible for the improvement in the sprayed fruit. But in the case under discussion there could be no such doubt, as there were sprayed rows on either side of the check or unsprayed one, and in every case the sprayed fruit was conspicuously better than the unsprayed.

F. C. SEARS,

Nova Scotia School of Horticulture.

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MASSEY-HARRIS CO., LIMITED,

Toronto, 9th Nov., 1898.

Spramotor Company, London, Ont:

Gentlemen,—The machines for spraying and whitewashing you have supplied to Dentonia Park Farm have done their work well, and are quite satisfactory. I could not have believed there was so much value in spraying fruit trees. We had a good crop of apples, whereas our neighbors, who used no spraying apparatus, had practically none.

Yours truly, W. E. H. MASSEY.

## What it Costs to Spray.

**COST OF SPRAYING 400 TREES SIX TIMES,  
BY W. H. HEARD, AT ST. THOMAS.**

Date of Spraying.	Barr'l's Used.	Gall. Used.	Composition of Mixture.			Cost of each Spray- ing with- out Labor	Labor Per Hour Boy 5c Man 10c	Horse Per Hour 5c	Total Cost.	Cost p'r Barr'l		Cost per Tree	
			Copp'r Sulph. l.bs.	Lime Lbs.	Paris Green. Ozs.					Incl'd- ing Labor.	With- out Labor.	Incl'd- ing Labor.	With- out Labor.
April 18-20 ..... Cost.....	7 .....	350 1c pr g	none .....	28 14c	42 42c	\$0.56	15 h \$2.25	15 h \$0.75	\$3.56	51c	08c	89-100 OF 1 CENT.	14-100 OF 1 CENT.
May 1-2 ..... Cost.....	9 .....	450 1.3c	36 \$2.16	36 18c	54 54c	\$2.88	20 \$3.00	20 \$1.00	\$6.88	76c	32c	1.72	72-100
May 14-16 ..... Cost.....	10 .....	500 1.64c	40 \$2.40	40 20c	40 40c	\$3.00	26 \$3.90	26 \$1.30	\$8.20	82c	30c	2.05	75-100
May 30-June 2 ..... Cost .....	11 .....	550 1.5c	44 \$2.64	44 22c	44 44c	\$3.30	25 \$3.75	25 \$1.25	\$8.30	75½c	30c	2.07	83-100
June 12-14 ..... Cost.....	11 .....	550 1.69c	44 \$2.64	44 22c	44 44c	\$3.30	30 \$4.50	30 \$1.50	\$9.30	84½c	30c	2.32	82-100
June 29-July 1 ..... Cost.....	11 .....	550 1.73c	55 \$3.30	44 22c	none .....	\$3.52	30 \$4.50	30 \$1.50	\$9.52	86½c	32c	2.38	88-100
Total ..... Total Cost.	59 .....	2950 .....	219 \$13.14	236 \$1.18	224 \$2.24	\$16.56	146 h \$21.90	146 h \$7.30	\$45.76			11.43	4-14
Average.....	.....	1.48c	\$2.63	39c	45c	\$2.76	\$1.21	\$3.65	\$7.63	75.97c	27c	1.905	69-100

Careful study of this table will answer any question relating to "What it Costs to Spray." The cost is much lower than some authorities give, but this is the result attained with our **OUTFIT 2-G**, exactly the same as that awarded first place at the spray contest at Grimsby.

The greatest care was taken to insure its accuracy, and it can be relied upon. Our aim is to represent all the good qualities of the Spramotor, but not beyond the limits of honesty and truthfulness.



*"A pie in the hand is worth two in the pantry."*

# Summary of Report of Wm. M. Orr,

Supt. of Spraying Experiments.

Conducted throughout Ontario at 90 different places, by direction of Hon. John Dryden, Minister of Agriculture for Ontario, showing kind of Fruit Sprayed, and the gain made thereby.

Name of Apple.	W.A. Warren's Orchard at Trenton.		Geo. Adam's Orchard at Smithville.		J. R. Thorn's Orchards at Picton.		G. Moffat's Orchards at Wingham.		A. Cameron's Orchards, at S. Lancaster.		All the Orchards Sprayed Total.		Average Per cent.	
	SPRAYED	UNSPRA'D	SPRAYED	UNSPRA'D	SPRAYED	UNSPRA'D	SPRAYED	UNSPRA'D	SPRAYED	UNSPRA'D	SPRAYED	UNSPRA'D	SPRAYED	UNSPRA'D
Spy.....	76	8	90	0	90	10	80	0	.....	.....	336	18	84	4½
Snow.....	75	0	80	0	75	25	100	5	00	.....	430	30	86	6
Wealthy.....	90	20	.....	.....	.....	.....	.....	.....	.....	.....	90	20	90	20
S. Permain.....	75	5	.....	.....	.....	.....	.....	.....	.....	.....	75	5	75	5
Baldwin.....	90	10	.....	.....	.....	.....	.....	.....	.....	.....	90	10	90	10
B. Greening.....	76	5	.....	.....	.....	.....	95	30	.....	.....	171	35	85½	17½
Swaar.....	.....	.....	80	0	75	10	.....	.....	.....	.....	155	10	77½	5
Rox. Russet.....	.....	.....	90	0	.....	.....	.....	.....	.....	.....	90	0	90	0
Canada Red.....	.....	.....	90	0	.....	.....	.....	.....	.....	.....	90	0	90	0
Newton Pip.....	.....	.....	90	0	.....	.....	.....	.....	.....	.....	90	0	90	0
Colvert.....	.....	.....	.....	.....	90	.....	90	40	.....	.....	180	40	90	20
St. Lawrence.....	.....	.....	.....	.....	75	10	.....	.....	10	.....	165	20	82½	10
Golden Russet.....	.....	.....	.....	.....	90	25	.....	.....	.....	.....	90	25	90	25
Bellefleur.....	.....	.....	.....	.....	75	10	.....	.....	.....	.....	75	10	75	10
Red Astrachan.....	.....	.....	.....	.....	80	15	.....	.....	.....	.....	80	15	80	15
Blow Pippin.....	.....	.....	.....	.....	.....	.....	90	0	.....	.....	90	0	90	0
Duchess.....	.....	.....	.....	.....	.....	.....	100	50	.....	.....	100	50	100	50
Maiden's Blush.....	.....	.....	.....	.....	.....	.....	95	50	00	.....	195	50	97½	25
Tal. Sweet.....	.....	.....	.....	.....	.....	.....	75	2	.....	.....	95	2	95	2
Alexander.....	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	100	10	100	10
Baxter.....	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	90	10	90	10
Hash.....	.....	.....	.....	.....	.....	.....	.....	.....	20	.....	100	20	100	20
Actual results...	482	48	520	00	650	105	745	177	580	70	2977	380	AVERAGE.	PER CENT.
Total possibility	600	600	600	600	800	800	800	800	600	600	3400	3400	87¼%	11½%

GOVERNMENT OF NOVA SCOTIA, AGRICULTURAL DEPARTMENT.

PROVINCIAL AGRICULTURAL FARM,  
Truro, Nova Scotia, Aug. 1, 1900.

To the Spramotor Co., London, Ont.:

Gentlemen, It affords me a great deal of pleasure to state that the Spramotor Jr., No. 2, purchased from you one year ago has given me the most perfect satisfaction.

F. C. FULLER, Supt. Government Farm.



All the kinds are shown in the same way, and the total of all kinds sprayed showed 2,977 barrels of perfect fruit out of 3,400 barrels, or  $87\frac{1}{4}\%$ , while of those unsprayed only 360 barrels were good out of 3,400 barrels, or  $11.17\%$ .

The above results are amazing, and as the places at which the experiments were carried on cover the entire province for a period of three years, therefore, nothing of the kind, in point of range, proportion and thoroughness, has ever before been attempted, and when the method, quality and disinterestedness of the authorities is considered, it leaves nothing further to be desired.

The total number of trees sprayed at all the places during the year was six hundred; and the average yield of the sprayed trees was about two barrels to the tree. The apples sold from \$3.50 per barrel in the east to \$1.50 elsewhere, or an average price per barrel of \$2.50; thereby we arrive at the amount of money made by spraying these six hundred trees.

Six hundred trees at two barrels per tree equals twelve hundred barrels. By referring to the table it will be seen the percentage of good fruit on the sprayed trees was  $87\frac{1}{4}\%$ , or ten hundred and forty-seven barrels, which, at \$2.50 per barrel, equals \$2,618.00.

The experience of the year's work, in regard to the yield, verifies the results stated in the Dominion Bulletin, No. 23, 1895, showing seventy-five per cent. of the yield was on the sprayed trees; leaving the average yield per unsprayed tree at one-half barrel.

Six hundred trees, at one-half barrel per tree, equals three hundred barrels. Referring again to the table, it will be seen that the  $11\frac{1}{6}\%$  of the fruit was firsts, therefore  $11\frac{1}{6}\%$  of three hundred barrels equals thirty-three and a-half barrels of good fruit, at \$2.50 per barrel equals \$83.75, or a clear gain in favor of the operation of spraying of \$2,534.25.

The conception of the idea of testing the effects of spraying in the manner expressed in the report, indicates great foresight on the part of Mr. Dryden, and the action of the Department of Agriculture of Ontario, whereby the report was made possible, is one of the most striking examples of the kind of work that is making Ontario, agriculturally, the most progressive country in the world.



LECTURE, AFTER OPERATION OF SPRAYING, BY MR. MCPHERSON, AT SOUTHAMPTON.

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QUEBEC COLD STORAGE & WAREHOUSE COMPANY,  
Commissioner's Wharf,

Quebec, February 17th, 1902.

The Sframotor Co., London, Ont.

Gentlemen,—The Sframotor machine, as supplied by your Company some time ago, has given every satisfaction, and we would not be without one in any case, especially where we have large surfaces to cover. Yours truly,

C. I. DANVILLE, Chief Engineer.



SPRAYING FOR SCALE INSECTS WITH THE SPRAMOTOR COMBINATION.

## APPLES.

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### FUNGUS DISEASES.

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**SCAB**—The Apple Scab is caused by a minute parasitic fungus, a low form of plant life which, by living on the leaf and fruit of the apple, prevents assimilation in the former and development of the latter. It is not so generally known that the same fungus attacks both the leaves and the fruit. Prof. Scribner says: "On the leaves the first manifestation of the presence of the parasite is the appearance here and there over the surface of smoky, olive green spots, rounded in outline. The older spots range from one-eighth to one-half an inch in diameter, or they may appear as large irregular blotches, by the running together of several of the spots first formed. They are for the most part confined to the upper part of the leaf, which often becomes more distorted through the unequal development of the two surfaces. The color of the older spots is nearly black and their surface somewhat velvety. The growth of the young shoots is sometimes seriously checked through the direct action of the fungus upon them, and when the foliage of a tree is much affected its nutrition must be seriously impaired. The tree is rendered less liable to stand the severe cold of the winter season and is rendered more likely to injury from early and late frosts." Cool, damp weather is especially favorable to the development of this disease, and it is during such seasons that it spreads with such rapidity. Last season was a characteristic one in this respect, so that whether the coming summer be dry or wet it may be expected that with the crop of seed (spores) now on hand we must be prepared to fight the disease, as it will surely be more or less prevalent.

**Remedies**—Spray according to calendar pages 48 and 49.

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#### PARLIAMENT BUILDINGS,

Toronto, July 26, 1897.

W. H. Heard, Esq., Mangr. Spramotor Co., London, Ont.:

Dear Sir,—We have tested the Spramotor which you sent us and find it a serviceable and economical device. It is a perfect implement for spraying apple trees, and we find that two men can thoroughly spray from five to seven acres of potatoes in a day, and not be hard worked. For whitewashing the inside of stables, poultry houses, and other farm buildings, I find your Spramotor invaluable.

Yours very truly,

F. W. HODSON.

**BITTER ROT** attacks the fruit about the time it begins to ripen. It continues after the fruit is stored, often causing great loss.

**Remedies**—Bitter Rot makes its appearance in the form of small black or brownish specks. These enlarge rapidly and soon extend over a large part of the surface. As soon as the first signs of the disease are observed, spray with ammoniacal solution, repeating the operation every ten days until the fruit is ripe. If there is much rot when the fruit is gathered, this should be carefully assorted before storing. All fruit showing rotten spots should be taken out. The sound fruit should then be dipped in a solution made by mixing one ounce of concentrated potassium sulphide solution in five gallons of water. After the fruit is dried it may be stored in the usual way.

The remedy recommended is the now well known Bordeaux mixture, which is so dirty a mixture to handle that many persons will not apply it. Fortunately for such gentlemen, the Spramotor people have invented a protection just under the nozzle at the top of the pole, by the use of which all leaking Bordeaux is shed off, leaving the pole always perfectly clean and dry for handling without gloves.

—*Canadian Horticulturist.*

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## INSECTS AFFECTING.

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**POWDERY MILDEW** only causes serious injury in the nursery. Seedlings are especially subject to its attacks, and as a result they are often rendered useless for stocks.

**Remedies**—Ammoniacal solution is found to be one of the best remedies. It should be applied first when the leaves are just starting, and thereafter at intervals of fifteen days until three or four weeks after budding. This will necessitate about six sprayings, the total cost of which, if made with the Spramotor and nozzles, need not exceed twenty-five cents per thousand trees

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## THE BUD MOTH.

[BULLETIN 107.]

N. Y. EXP. STATION.

We believe the pest can be reached with an arsenical spray applied frequently and thoroughly. It will necessitate at least two thorough applications before the flowers open. If possible keep the swelling and opening buds coated with Paris Green so that the little caterpillar's first meal in the spring will be a poisonous one. In order that the spraying should be thoroughly done at this time, fruit growers should realize that if the insect is not killed before the blossoms open they will not have another chance to do it nearly so effectively until the next spring.

If the trees are usually badly infested with the apple scab or other fungi it would be well to combine the Paris Green with the Bordeaux mixture, and in this case using

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BIOLOGICAL DEPARTMENT.

ONTARIO AGRICULTURAL COLLEGE,

Guelph, Can., Sept. 12, 1899.

The Spramotor Co., London, Ont.:

Dear Sirs,—The experiments I conducted during the past summer in weed spraying, clearly indicated that spraying with a solution of copper sulphate will completely destroy wild mustard [*Brassica Sinapistrum*] in grain crops. I applied my solution with a Spramotor machine, which gave entire satisfaction.

Yours truly,

M. W. DOHERTY, B.S.A., M.A

about one pound of the poison to one hundred gallons of the fungicide. The poison will adhere longer if applied with the fungicide. If Paris Green only is applied, use about one pound to two hundred gallons, and always add two or three pounds of freshly slacked lime to prevent the burning effects of the free arsenic in the Paris Green. Take special pains to thoroughly wet the buds on the smallest twigs. With at least two thorough applications of Paris Green before the flowers open we believe this insect can be effectually checked for the season. Do not spray when the trees are in bloom, as many honey-bees may be killed.

The limited time during which this bud moth can be reached by sprays renders it an especially hard insect to fight. It will require thoughtful, intelligent and persistent work early in the spring to hold it in check.

M. V. SLINGERLAND.

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## GREEN FRUIT WORMS.

[BULLETIN 123.]

N. Y. EXP. STATION.

The parents of the "green fruit worms" are night flyers, remaining concealed during the day, appearing during September and October, and hibernating to appear again in March, April and May.

There is but one brood in a year, working mostly in May, pupate in the soil in June, remain during summer and sometimes all winter, although most of the moths emerge in the fall and hibernate, laying their eggs in the spring.

These green fruit worms are, when grown, from 1 inch to 1½ inches long, a narrow cream-colored stripe down the middle of the back, a wide stripe of same color along each side, and many similarly colored mottlings which sometimes form quite distinct stripes along the body above the broad lateral stripes.

**Remedies**—The same treatment laid down for the bud moth and case-bearer will answer. A thorough spraying at least once before the blossoms open, 1 pound to 100 gallons. Late sprayings, after the fruit is large enough for the worms to eat, will avail but little.

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## APPLE TREE TENT-CATERPILLAR—

The large silken nests made by this insect are familiar to everyone. The caterpillars appear in May or June, and in five or six weeks have reached their full size.

The eggs are laid in compact masses of from two to three hundred around the twigs. After they are laid the parent covers them over with a liquid which dries and completely seals them over.

The insect remains in this state from July until the spring following, when they emerge from the eggs and commence feeding on the tender foliage of the buds. In a day or so they commence the tent and retire to it at

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## OHIO AGRICULTURAL EXPERIMENT STATION.

ENTOMOLOGIST

DEPT. OF NURSERY

DEPARTMENT.

AND ORCHARD INSP.

F. M. WEBSTER, M. Sc.,

F. M. WEBSTER.

Entomologist.

Chief Inspector.

Wooster, Ohio, Sept. 6th, 1901.

The Spramotor Co., London, Can., Buffalo, N. Y.:

Gentlemen,—I have used the Spramotor which I purchased from you last spring in experimental work. I can say it has given me better satisfaction than anything else I have ever tried for spraying crude petroleum mixtures. The machine works easy, and has given me entire satisfaction.

Yours truly, F. M. WEBSTER, Entomologist.



night, or during cold or wet weather. When full grown are two inches long, having a hairy body ornamented with a white stripe down the middle of the back and several short parallel, irregular, yellow lines, while the sides have paler lines, spotted and streaked with blue, the belly being black.

**Remedies**—Cut out and burn the nests as soon as they are seen, taking the precaution to do this in the morning, when caterpillars are all in. Spray as per spray calendar.

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### **Treatment for Forest Tentless Caterpillars and Apple Tree Tent-Caterpillars**

—As soon as leaves open in spring spray shade trees with the following solution :—Dissolve three ounces acitade of lead in one quart of water in a wooden vessel ; dissolve in another wooden vessel one ounce arsenate of soda in one pint of water ; then empty the contents of the two vessels into a barrel of water (40 gallons). Stir well and add one quart of glucose, and apply with a Spramotor. The first tent caterpillar will prove a serious pest this coming June.

W. LOCHEAD, B. A., M. S., O. A. C., Guelph.

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**THE APPLE APHIS**—Apple trees are often attacked early in the season by this insect. The Aphides, or lice, are quite small and green in color. By sucking the juice from the young fruit they greatly interfere with its functions, and as a result the tree has a sickly yellow appearance.

**Remedies**—Spray with kerosene emulsion, at the rate of one gallon to twenty of water, as soon as the lice appear. Repeat the treatment in eight or ten days if necessary. A decoction, made by soaking over night four or five pounds of tobacco, or refuse tobacco of any kind, in five gallons of water will also be found an excellent remedy against the lice.

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### **THE CODLING MOTH—**

This is the most generally injurious apple insect, and is known wherever the fruit is grown. The small chocolate moth deposits its eggs in the spring in the blossom end of the young apple be-



CODLING MOTH.



APPLE WORM.

fore the latter has turned down on its stem. From the egg there hatches a minute worm, or caterpillar, which nibbles at the skin of the fruit and eats its way towards the core. Here it continues feeding until the apple develops, increasing in size until at the end of three or four weeks it is about  $\frac{3}{4}$  of an inch long, and appears as represented.

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### **CORNELL UNIVERSITY, COLLEGE OF AGRICULTURE.**

L. H. BAILEY, Chief.

JOHN W. SPENCER, Deputy.

JOHN CRAIG, Supervisor of

MARY ROGERS MILLER,

Farmer's Reading Course.

Lecturer in Nature Study.

Ithaca, N.Y., May 9th, 1901.

Mr. W. H. Heard, London, Ontario, Can.:

My Dear Sir,—We have been using your Spramotor in our orchard work and for demonstration purposes for the students during the past week. Our men who use it in the orchard speak of it in the highest terms. There is an abundance of power, and it works easier than any other pump we have on hand.

Yours sincerely, JOHN CRAIG.



FIG. 1.

Just right to spray. A pear and two apples from which the petals have recently fallen. Note that the calyx lobes are widely spread. (See Bulletin 142.)

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It has now finished its caterpillar growth and leaving the apple, finds some crevice in the bark, where it spins a rather slight silken cocoon, in which it changes to a pupa. It remains in this condition for about two weeks, when it emerges as a moth, like the one by which the original egg was laid. Then the life cycle is completed. There are at least two broods in a season in all but the most northern localities.



WORM OF THE CODLING MOTH.

**Remedy**—Spray as per spray calendar, pages 48 and 49.

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W. H. Heard, Esq.,

Spramotor Co., London, Ont.:

Dear Sir, I have to thank you for the copy of your excellent catalogue of the Spramotor pump. It is not only an artistic production, but it also contains a large amount of valuable and reliable information for fruit growers.

Yours truly,

LINIUS WOOLVERTON,

Editor Canadian Horticulturist.



FIG. 2.

Almost too late to spray apples effectively. Note that the calyx lobes are drawn nearly together on the two apples, while on the pear in the centre the calyx cavity is open.

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[EXTRACTS FROM BULLETIN 142.]

N. Y. EXP. STATION.

Just after the petals fell we found the blossom end of both apples and pears in the condition shown in Fig. 1. That is, the calyx lobes were spread wide open, forming a saucer-like cavity. We watched the pears also. The fruit to the left is a pear. About a week after the petals fell we found the blossom end of both apple and pear appeared as shown in Fig. 2. The centre fruit is a pear. The calyx lobes on the apple had begun to draw together, and within the next few days had drawn completely together, forming a tight cover over the calyx cavity. In the case of the pears the calyx lobes drew together but little.

We found no eggs until the calyx lobes were nearly closed. We found 85% of the worms of the early brood enter the apple through the blossom end. We found, by examination with a lens, traces of the poison after two weeks; the quantity from 50 apples was scarcely enough to weigh. Munson says  $\frac{3}{1000}$  part of a grain to an apple for two sprayings of two gallons each to a tree.

81. We were led to believe that, in applying a poisonous spray soon after the blossoms fall, we deposit some arsenic in the calyx cavity, where nature takes care of it for ten days or two weeks, when the little apple worm includes it in the menu of his first few meals.

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MICHIGAN CENTRAL RAILROAD.

St. Thomas, Ont., July 13th, 1899.

W. H. Heard, Esq.,

Manager Spramotor Co., London, Ont.:

Dear Sir,—The Spramotors for whitewashing cross fences, of which I received and used two this summer, were entirely satisfactory, and did all that was expected of them. I find them to be a great labor saving in doing this work.

Yours truly,

T. HICKEY,

Roadmaster.

*" You can drive a pen but a pencil must be lead."*

It is necessary to spray each year for the Codling Moth. There is no danger from the poison to stock or to the fruit trees from spraying. If the rains wash out the poison you must spray again at once and see to it that the poison is in the calyx cavity when nature closes them in.

To use the poison spray most effectively one must understand that it is necessary to fill the blossom end of each apple with poison within a week after the blossoms fall. And remember the falling of the blossoms is the signal to commence spraying. Do not depend on anything or anybody else, simply see to it that there is a good dose of poison in the blossom end of each apple and that the rains do not wash it out before nature protects it by closing in the calyx lobes.

There is but one brood in Canada, north of Toronto.

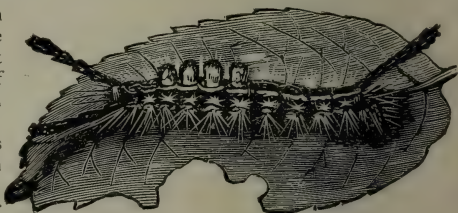
Two broods in New England States, New York, New Jersey and part of Canada, Michigan, Illinois, Iowa, Missouri, Kansas, Nebraska.

Three broods in California, Oregon and New Mexico.

M. V. SLINGERLAND.

**TUSSOCK MOTH**—This insect is one of the most destructive leaf-eating caterpillars, and during recent years has done much damage in many cities and villages.

The larvæ feeds upon the foliage of a great variety of fruit and shadetrees. The eggs hatch out in early May, soon after the leaves come out.



TUSSOCK MOTH.

The small caterpillars begin eating at once, and continue five or six weeks before they become full grown. During July the caterpillars spin the whitish cocoons on the rough bark, and in two weeks come forth as moths. These lay eggs for the second brood, which completes its transformation before winter sets in.

**Remedy**—Spray Paris Green, 4 ounces to 50 gallons.

**CANKER OR MEASURING WORM**—If, during the winter or early spring, one examines the branches of apple trees in orchards where the insect has

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#### TREASURER'S OFFICE,

Buffalo, N.Y., Oct 22, 1900.

Messrs. Spramotor Co., London, Ont.:

Gentlemen,—After having bought and used one of your "Spramotors" from your representative, Mr. T. T. Heard, who claimed everything for it in the way of spraying orchards, potatoes, and eradicating wild mutard in growing grain without injury to the grain, and after carefully testing the machine, I have proved to my entire satisfaction that it is the best thing in the market for all such purposes.

In whitewashing my stables and disinfecting, I found it a great saving in time and material, especially when used on rough boards, as it forces the disinfectant and whitewash into all the cracks, crevices and corners, leaving the surface perfectly white and smooth. I think it has great advantages over brush work on that account, as the microbes of disease and all insects will secrete themselves into those places where the brush cannot reach them, and the machine will.

Very truly yours, PHILIP GERST.



been at work he will find compact masses of one hundred or more small cylindrical eggs. About the time the leaves begin to appear, these hatch into small, looping caterpillars that feed upon the green portion of the foliage. They continue feeding and growing for several weeks, when they become full grown, and are about one inch long and quite slender, and vary from a greenish-yellow to a dark brown color. Then it burrows into the soil four inches, where it spins a silken cocoon, within which it changes to the pupa or chrysalis state; remaining in this condition until autumn, when it emerges as a moth.

The sexes differ greatly. The male has large, well developed wings, and the female is wingless.

**Remdies**—Spray as per spray calendar, pages 48 and 49.

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### THE OYSTER SHELL BARK LOUSE

—There are frequently seen on the trunk, branches and twigs of the apple tree small, whitish shells, resembling in shape those of an oyster. Under these shells are numerous small lice, busily engaged in sucking the sap from the tree. In some sections the insect is exceedingly troublesome, often attacking many trees in an orchard.

**Remedies**—Scrape the trees thoroughly in the spring, before the leaves appear.

**Winter Treatment**—A mechanical mixture of crude oil and water, or kerosene and water (1 of oil to 4 of water), sprayed on the tree with the **SPRAMOTOR COMBINATION**, FIG. 21, in the winter, or as late as possible before the buds start in the spring, will clear the orchard of the Oyster Shell, San Jose Scale, as well as a whole host of insects that hibernate upon the tree through the winter, and which come to life at or about the time of the commencing of vegetation in the spring. (See treatment of San Jose Scale.)

**Spring Treatment** should take place when the young lice are running about on the bark, usually from the middle of May to the middle of June. Then spray with crude oil as recommended above. Whale Oil Soap, full strength, 2½ lbs. to the imperial gallon, or 2 lbs. to the wine gallon will be right.

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### THE CIGAR CASE-BEARER.

[BULLETIN 93.]

N. Y. EXP. STATION.

To summarize, we believe that the Cigar Case-bearer can be kept in check by two or three sprayings with Paris Green—one pound to 200 gallons of water. The first application, which may be effectively combined with the Bordeaux mixture then to be used for the Apple Scab fungus, should be made as soon as the little cases are

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### OFFICE OF THE WESTERN FAIR.

London, Ont., April 20th, 1897.

W. H. Heard, Esq. Manager of Sframotor Co.

London, Ont.

Dear Sir,—We desire to express, without reserve, our approval of the satisfactory manner in which the whitewashing of our Fair buildings was done last year, having in view the great saving in cost and superior quality of the Sframotor process of whitewashing over past methods. The Western Fair Association have decided to do their own whitewashing and painting in future.

You will therefore please deliver to us one of your Sframotor whitewashing outfits, complete with barrel and screen, with the necessary accessories for both high and low work of the same character.

We can, from actual experience of work performed, honestly recommend your Sframotor to the public generally, as being a genuine and practical apparatus for the purpose expressed.

Yours very truly,

THOMAS A. BROWNE,

Secretary.

seen on the opening buds. A second, and perhaps a third, application may be necessary at intervals of four or seven days on badly infested trees. These sprayings will also check the Bud Moth.

Furthermore, it has been experimentally demonstrated in Canada that a kerosene emulsion spray, applied at the same time as directed above for Paris Green, still more effectively checks the Case-bearer, and we believe it would act likewise on the Bud Moth. In pear orchards both this Case-bearer and the Pear Psylla can be effectively checked by the same emulsion. Spray when the leaves are opening in the spring. Never spray a fruit tree when it is in blossom. Remember that success in any case will depend entirely on how thoroughly the spraying is done.

M. V. SLINGERLAND.

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## PEARS.

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### FUNGUS DISEASES.

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**PEAR SCAB**—The scab and spotting of the pear is caused by the same fungus as that causing scab on the apple, and the same remedy applies. Spray as per spray calendar.

**PEAR BLIGHT**, also known as **Twig Blight**, **Fire Blight**—This trouble is caused by a germ known to science as *micrococcus amylovorus*. This bacterial disease causes the foliage to turn to a uniform brown, sometimes in two or three days (the leaves do not fall), thus giving the tree the appearance of being scorched by fire.

The bark of the affected parts becomes sunken and brown. The germ enters the tree through the blossoms and also through the growing tips. The injury may be local or extend to the entire tree. Rapid growing trees are most liable to be affected, hence the importance of a steady growth in fruit trees.

There is no known certain remedy, and the only way to check the disease is to cut out all the affected parts a foot below the lower point of injury, and burn. These affected parts are full of germs and must be destroyed or they will soon scatter and increase the trouble. Clean, culture, and spray promptly and thoroughly.

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**LEAF BLIGHT AND CRACKING OR SPOTTING OF FRUIT**—These diseases, caused by the same fungus, are much more troublesome than scab. Trees of all ages are subject to them, the greatest damage being probably in the nursery.

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Trained Wild Animals.

FRANK C. BOSTOCK,

THE ANIMAL KING,

BOSTOCK'S GREAT ZOOLOGICAL ARENA.

Pan-American Exposition,

Buffalo, N.Y., Sept. 25th, 1901.

The Spramotor Co.,

109 Erie St., Buffalo, N.Y.:

Gentlemen,—I purchased from your Company a "Spramotor" painting machine, with which the interior of my Trained Wild Animal Arena building was painted; using thereon two 50-foot lengths of hose. The machine was easily operated by one man, and the work entirely satisfactory in every respect, and I cheerfully recommend the "Spramotor" to anyone who may need such an apparatus.

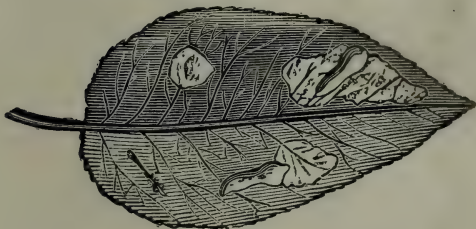
Very respectfully,

FRANK C. BOSTOCK.

**Remedies** — In the nursery treatments should begin with the seedlings, as it is of the highest importance to hold the leaves on these until the buds are inserted and established. When the leaves on the seedlings are about one-third grown, spray with Bordeaux mixture. In two weeks spray again, repeating at similar intervals until six or seven applications in all have been made. Such a course of treatment will hold the leaves on until after frost, and as a result the stocks will "work" without difficulty and make a vigorous growth. The next season's treatment should again be made in the same way, beginning just as soon as the buds start. Careful experiments have shown that it is possible by work of this kind, to obtain a growth in two years equal to that of three or even four under ordinary conditions. In the orchard either Bordeaux mixture or the ammoniacal solution (preferably the former) may be used. To prevent Leaf Blight and Cracking at the same time, the first treatment should be made when the flowers are falling. A second spraying should be made when the fruit is the size of peas, followed by a third fifteen days later. Such a course of treatment will also prevent Scab, which not uncommonly occurs associated with Leaf Blight and Cracking.

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## INJURIOUS INSECTS.



CHERRY AND PEAR SLUGS AT WORK.

**THE PEAR TREE SLUG** attacks the leaves, eating away the green portion so that nothing remains but the parchment-like tissues and veins. It appears usually in latter part of June and again in August.

**Remedies**—Spraying with a simple solution of milk of lime, made by mixing four pounds of lime in fifty gallons of water will often rid the plants of this pest. The first applications should be made as the slugs are noticed. If necessary, others should follow in a week or ten days. By adding a little Paris Green—say four ounces—to the lime milk the latter will be made far more effectual.

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Woodville, Oct. 6th, 1899.

Spramotor Co., London, Ont.

Dear Sirs,—I am writing this to you to let you know that I am more than pleased with the Spramotor No. 2 Jr., which you sold me. I am sure the valve and the plunger can not be beaten anywhere. I left the pump in tank in front of my house for 14 days, and when I went to work again to do the second spraying I turned the stop-cock to spray. The spray came out with great force. No one had moved the handle as I had taken out the pin. I have used the Gould's Feided Force Pump, Eclipse, Empire, King and Pomona. They did not keep up pressure and worked very hard. This one made in London, Ont., is the very best I have ever seen. It keeps up pressure, agitates the mixture, and holds the pressure, stored up from tree to tree, and from orchard to orchard. It does not use half the mixture to do the work, and has better effect on fruit. Hoping you will sell hundreds more as good,

I am, yours sincerely,

G. W. F. McLEAN.

**THE SCURFY BARK LOUSE** resembles the Oyster Shell Bark Louse already described as attacking the apple.

**Remedies**—The method of dealing with the Oyster Shell Bark Louse.

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**THE PEAR TREE PSYLLA** — The adult Pear Psylla is a small jumping louse about one-tenth of an inch long. It has four transparent wings, and is reddish with traverse dark spots on the abdomen. There are two distinct forms. The summer brood is much lighter in color than the brood which passes through the winter. The difference is so great that the two forms were considered distinct species until the life history was worked out by Mr. M. V. Slingerland.

The dark form passes through the winter in some sheltered situation about the tree, such as beneath loose bark or in the crevice between the branches. In early spring they come forth from their hiding-places and deposit their eggs about the buds and on rough bark. These eggs are very small and of extraordinary form. When first deposited they are yellowish, but turn dark soon thereafter. The eggs hatch in three or four weeks, the time depending largely on weather conditions.

The sap which passes through the bodies of these little creatures is ejected on the foliage, and forms the so-called "honey-dew." Where the insects are so very numerous this becomes very abundant, falling in showers when the branches are disturbed. After the honey-dew has been present for some time, a peculiar black fungus develops upon it and gives the tree a sooty appearance.

**Remedies**—The insect can be destroyed by spraying in spring—after the eggs hatch out and before the first brood matures—with kerosene emulsion diluted with twenty-five parts of water. This is a simple and satisfactory remedy. If applied soon after a shower has washed off much of the honey-dew it is more effective.

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## PLUMS.

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### FUNGUS DISEASES.

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[BULLETIN 23.]

CENTRAL EXP. FARM.

The principal fungus enemies of the Plum are the "shot-hole fungus" (septoria), causing the leaves to drop prematurely, and Monilia, or fruit rot. These were satisfactorily controlled by spraying. The foliage of the treated trees was retained till the close of the season, and the fruit was 20 per cent. to 30 per cent. larger than on the trees not sprayed. The sprayed plums would easily sell as good "firsts," while the unsprayed, owing to small size and lack of color, could hardly be classed as seconds.

JOHN CRAIG.

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[BULLETIN 37.]

HATCH EXP. STATION.

Plums were sprayed April 5 with Bordeaux mixture; May 3, Bordeaux mixture and Paris Green, 1 pound to 100 gallons; May 20, Bordeaux mixture and Paris Green, 1 pound to 100 gallons; June 6, Bordeaux mixture

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St. Thomas, Ont.

The London Spramotor Combination is the only reliable machine I know for spraying mechanical mixtures of oil and water.

GEO. E. FISHER, Inspector.



*"Always put off for to-morrow what does not concern you."*

and Paris Green, 1 pound to 100 gallons ; August 8, with ammoniacal carbonate of copper.

On sprayed trees the fruit rotted much less than on unsprayed trees, but was not wholly free from rot.

On sprayed trees the curculio did much less damage than on the unsprayed ones. After all the fruit stung by the curculio was picked off a good crop remained.

On some unsprayed trees the curculio ruined the crop.

On the Washington plum trees spraying had the most beneficial effect. On the Lombard plums the effect was good ; at least twice as much fruit maturing on sprayed trees as upon those unsprayed.

## BLACK KNOT.

[BULLETIN 81.]

N. Y. EXP. STATION.

1. A thicket of Morello cherries, which had been treated during two seasons by this station, produced only 165 new knots.

2. From another portion of the same thicket, which had not been treated, there were cut 2,002 knots on April 25th, 1894. On November 25th, of the same year, this portion yielded 3,466 new knots, an increase of nearly 58 per cent.

3. Had the sprayed portion remained untreated, it may be supposed that a similar increase would have taken place in this part, making the assumed number cut within a fraction of 2,000.

4. The reduction of the number of knots from 2,000 to 165, considering the present state of our knowledge and the condition under which the experiment was carried on, is encouraging, and points to the final control of the disease.

5. Some of the applications which now appear necessary for the control of the Black Knot are to be made when other diseases require treatment. This necessitates but little extra labor in spraying for the prevention of knots.

6. The spraying of plums and cherries to protect them from the Black Knot Fungus can be carried on with profit in all sections where the disease threatens to interfere seriously with the profitable cultivation of these fruits.

[BULLETIN 37.]

HATCH EXP. STATION.

The result of spraying for the destruction of the Black Knot, or wart, are shown in the following tables :

VARIETIES.	NUMBER OF KNOTS FOUND.			
	1892.	1893.	1894.	1895.
Washington... } Sprayed.....	0	5	2	0
Lombard ..... }	22	8	7	0
Washington... } Not Sprayed.	6	20	8	7
Lombard ..... }	22	10	10	5
Washington... } Sprayed.....	5	10	3	0
Lombard ..... }	66	27	10	1
Washington... } Not Sprayed.	9	15	10	*0
Lombard ..... }	13	19	4	*1
Lombard, sprayed.....	1	3	0	0
Total.....	144	117	54	14

### AVERAGE NUMBER OF KNOTS PER TREE.

Sprayed .....	18.8	10.4	4.5	.3
Not Sprayed.....	12.5	16.0	8.0	6.0

London Spramotor Co.

Corbyville, Ont.

Gentlemen,—I have used your sprayer for whitewashing, fruit trees, washing buggies, cow stables, hen coops, pig pens, etc., and can not but state that it does all that is required successfully.

W. C. FARLEY, Corbyville, Ont.

The trees were sprayed with copper sulphate solution. Bordeaux mixture and ammoniacal carbonate of copper. The knots were painted with kerosene and mineral pigment during the summer, and removed during the early part of winter. When found on small twigs the knot and branches were removed, but when found on large limbs or strong shoots the knots were sliced off and the wound painted with lead and oil. This treatment has been given to sprayed and unsprayed trees alike. By studying the above table, which shows the result of the treatment on a row of Washington and Lombard trees, we find :

1st. That the total number of knots has been steadily decreasing.

2nd. That the average number on the unsprayed trees has decreased to one-half the number in 1891, while on sprayed trees it has decreased to 1.52 of the number found four years ago, or where one knot has been destroyed by painting and cutting, twenty-six have been destroyed by combining this treatment with spraying.

In December, 1895, eighty-eight plum trees of bearing size, including many varieties, were examined, and the knots were removed. These trees, with the exception of two Wild-Goose, one Pottawatamie and three Japanese varieties, were all European plums.

The results of the examination were as follows : On 78 sprayed trees were found 39 knots, an average of one knot to each two trees ; on 10 unsprayed trees were found 52 knots, an average of 5.2 knots per tree. Thus the total number of knots found in the Station orchards in 1895 was 91. In 1891 there were found on one Bradshaw tree 78 knots, or nearly as many as were found in the entire orchard in 1895, and twice as many as were found on all the sprayed trees in 1895. The tree above mentioned has been treated as above described and sprayed, and at the present time is entirely free from knots. Of the 78 sprayed trees, 50 were found free from knots. Of the 10 unsprayed trees, one, a Wild Goose, was found free from knot.

#### SUMMARY.

1st. By painting the plum knots with kerosene during the summer, and removing from the tree and burning early in the winter before the winter spores are scattered the disease can be held in check.

2nd. By combining the above treatment with proper spraying the disease can be prevented and practically eradicated from orchards that have suffered from a severe attack.

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**LEAF BLIGHT** is often quite destructive in the nursery, attacking the leaves as soon as they appear and causing them to fall in midsummer.

**Remedies**—Treat the same as recommended for Leaf Blight in the Pear. In case, however, it is not found convenient to use Bordeaux mixture the ammoniacal solution will answer as well. In the orchard Leaf Blight often causes serious damage. Treatments here should begin as soon as the leaves are formed and be continued at intervals of ten or twelve days, until five or six sprayings have been made.

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Toronto, Aug. 17, 1897.

W. H. Heard, Esq., Mgr. Spramotor Co., London:

Dear Sir, — The Spramotor purchased from you last Spring I have fully tested, having used it for whitewashing buildings and spraying fruit trees, and it has proved satisfactory in every respect. Can honestly recommend it for either of the above purposes. Yours truly, ROBT. DAVIES.

**SAN JOSE SCALE.**—Mr. Geo. E. Fisher, Chief Inspector Ontario Government, and expert on the means necessary to combat the San Jose Scale, writes:

**All users of oil insecticides should read carefully.**



**MR. GEO. E. FISHER SPRAYING FOR THE DESTRUCTION OF THE SAN JOSE SCALE, AT ST. THOMAS, ONT.**

Orchards in which only a small proportion of the trees were marked in '99, now have the scale on every tree, and many trees which were then but slightly infested are now encrusted. All orchards in such sections are now more or less affected, and growers have seldom discovered the scale in them till they found it on the fruit, the keeping quality of which is seriously impaired by a severe attack. Late ripening fruit were exposed through the whole of the breeding season, which commenced about the middle of June, and continued until the end of November, during which time the increase was simply marvellous.

The scale may be distributed by almost everything which moves, creeping and flying insects were freighted with it, birds, horses, and tools, &c., carry it; but the great distributing agent is the wind, and if the larvæ be deposited not too far from a tree, it will make its way to the trunk. The female has within herself the power of reproduction, and will establish a colony wherever she finds lodgment on a tree. The ability of the larvæ to help itself has been greatly underestimated. It will make substantial progress on the ground, and on a tree can advance at the rate of an inch in a minute, and get from the trunk to any part of a large fruit tree. The vigor of tender varieties should be well maintained as the only means of fortifying against an attack of scale, and of fitting them for treatment.

The best proofs of its identity the grower will find in its being plentiful and widely distributed over the tree, in its

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Winona, Ont., Dec. 29th. 1896.

Spramotor Co., London, Ont.:

Dear Sirs,— I will do all I can to place your pumps before the public, which I believe to be the best all round spray pumps made. After giving them several trials myself last season, can give them the above recommendation.

I am, yours truly,

E. M. SMITH



being present in all stages of development at all times of the year, and in its very distinct nipple and ring.

**The San Jose Scale may be profitably controlled by remedies.**

1. The San Jose Scale is apparently more susceptible than some of the other scales, and more easily destroyed, but its wonderful power of reproduction makes it important to reduce it to the narrowest possible margin, hence the absolute necessity for thorough work in treating it.

2. Of the sprays used against the scale, crude petroleum has proved the most effective, and it is cheap.

3. It is a strong remedy, and must not be used in excess of what is necessary to penetrate encrustation. Every part of the tree must be reached, but the spray must not be directed too long against any part of it.

4. Special attention must be given to the inside of the branches, the twigs and the deep cracks in the bark, to overtake individuals in hiding. Tender trees have been killed by excessive applications. It is safer to use crude petroleum diluted to 20 or 25 per cent. with water, and on peach trees to 15 per cent., which is effective, and must be applied with an emulsion pump.

The London Spramotor Combination is the only reliable machine I know for applying mechanical mixtures. No scale can live on an oil treated bark, and the oil not only kills nearly all of the scales, but protects the tree from reinfestation.

Too much crude oil will kill trees, and very little is necessary to kill the scale. If applied to peach trees, the treatment should be very light, even and complete. Crude oil should always be used thoroughly, but sparingly, and the best time to use it is in the spring, just before the leaves appear. Crude petroleum costs about one-sixth the price of soap treatment. Whale oil and crude petroleum may be combined in any proportion to suit tender trees.

Kerosene is not satisfactory except as a summer treatment, in the proportion of 10 per cent. with water for killing the young scales.

Whale oil soap,  $\frac{1}{2}$  lb. to the gallon, may be used for the same purpose. Neither of these summer sprays will penetrate the cover scale beyond the white stage, and to be effective must be repeated every ten days.

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## INSTRUCTIONS FOR SPRAYING.

Trees must be thoroughly pruned and all rough bark and lichen removed. Have a sufficient supply of material on hand and a proper pump for applying it. Do not spray the trees when wet. Thoroughness is imperative.

Soap can be used most effectively during the swelling of the buds and before the blossoms open. Even if a few blossoms are open no harm will ensue. An earlier application will destroy the fruit buds of tender trees. The tree should be sprayed till every part is saturated, the inside of the limbs, the twigs and crevices should have special attention. One and one-half gallons of the mixture is sufficient for a full grown peach tree.

If undiluted crude petroleum be used, the least possible quantity of oil that will cover every part of the tree should be applied with the very finest vermorel nozzle. It is safer to use oil diluted to 25 per cent. with water.

The Spramotor painting nozzle, either coarse or fine to suit the work, is best. While every part of the tree must be reached, no part should be covered twice with oil. A Spramotor combination pump only should be used in applying mechanical mixtures.

Treat for Lecanium and Pear Psylla early in April; San Jose Scale and other purposes as late as possible

before the buds open. First apple, then pear, then the hardier varieties of plums, then the tender varieties, and lastly peach, allowing sufficient time to complete the work. Crude petroleum should not be used at all on the foliage.

For summer spraying use kerosene 10 per cent. with water on bright airy days, which will promote evaporation. Or whale oil soap  $\frac{1}{2}$  lb. to the gallon of water whenever practicable. (Signed) G. E. FISHER, Inspector.

### SAN JOSE SCALE

— Prof. Alwood, of Virginia Experimental Station, after two year's experience, says: "The San Jose Scale is so minute that the best observers may overlook it in its incipency. It moves for a brief space of time only and then leads an obscure life with practically nothing to herald its presence to the ordinary man, until it is so numerous that the plant infected is seriously injured or is about to succumb.

It breeds by such an enormously increasing geometrical ratio, that the mind is staggered at the mere statement of its fecundity. It never leaves its host plant, winter

or summer, and is liable to be disseminated by the most trifling incident as the insertion of a scion, the placing of a bud, the purchase of a single plant, the blowing of a leaf or the passing of a bird. When all these things are realized, you will understand there is reason for alarm."

Prof. L. G. Howard, entomologist to United States Government, describes the San Jose Scale as round or slightly elongated or irregular. It is flat, pressed close to the bark, resembles the bark of twigs in color, and when fully grown is about one-eighth of an inch in diameter. At or near the middle of each scale is a small, round, slightly elongated, black point, or these points sometimes appear yellowish.

When upon the bark of twigs or leaves in large numbers, they lie close to each other, frequently overlapping, and are at such times difficult to distinguish without a magnifying glass. The general appearance which they present is of a grayish very slightly roughened scurfy deposit. The branches have the appearance of being covered with lime or ashes. When crushed, a yellowish oily liquid will appear, which will at once indicate the presence or healthy living scales on the tree. The young scale lice come out from under the female scales in the spring, soon after the unfolding of the leaves. They are minute yellowish creatures, and crawl about for a short time, and then fasten themselves generally on a new growth, when they secrete a scale and there develop.



SAN JOSE SCALE, NATURAL SIZE.



OYSTER-SHELL BARK-LOUSE, NATURAL SIZE. OFTEN MISTAKEN FOR THE SCALE.

[BULLETIN 155.]

N. Y. EXP. STATION.

From our study of the subject we draw the following

SUMMARY :

1. Pure kerosene is likely to seriously injure peach trees even when they are perfectly dormant.

2. A 20 per cent. mixture of kerosene can probably be safely used on the peach at any time, but a stronger mixture cannot always be so applied.

3. Apple trees do not appear to be as susceptible to the action of the kerosene as peaches. In some instances clear kerosene did not harm them.

4. There seems to be little, if any, danger to apple trees from a mixture containing 50 per cent. or less of kerosene.

5. Kerosene is especially likely to cause injury if applied on other than a bright sunny day.

In our experience, a 20 per cent. solution (1 part oil to 4 parts water) is harmless to plants and destructive to insects, even to the San Jose Scale. H. P. GOULD.

[BULLETIN 117.]

N. Y. STATION.

The San Jose Scale is still with us. It will stay. There is no hope of eradicating it. Then every man should be prepared to meet it. He should not rely on State control alone.

For three seasons now we have experimented with the kerosene and water emulsion—as others have done—and have found that it is a specific for the scale. In the proportion of 1 part of oil to 5 of water in summer, and 1 to 4 in winter, it will kill the scale.

The San Jose Scale can be controlled in a plantation by a 20 per cent. kerosene and water mixture when the plant is thoroughly sprayed. Early spring or late fall spraying is preferable, but the material may be applied when the plant is in full leaf if the day is sunny.

Only on sunshiny days should sprays of kerosene and water be used.

Compared with fumigation on growing trees, spraying is cheaper, simpler, and perhaps equally effective in the long run. Nursery men will find fumigation better adapted to their needs than spraying. On growing plants, however, it is attended with difficulty, because of the necessity of providing tents. L. H. BAILEY.

Peach trees should not be treated until the buds are beginning to redden in the spring, or the fruit crop for the coming season may be destroyed.

[BULLETIN 138.] NEW JERSEY EXP. STATION, Sept., 1899.

Since January, 1898, nearly 4,000 trees of the ordinary orchard fruits other than cherry have been treated with crude petroleum, either undiluted or mixed with from 60 to 75 per cent. of water. The trees varied from stock just out of the nursery row to old trees in full bearing.

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London, Ont., August 9th, 1897.  
The Spramotor Co., London, Ont.

Dear Sirs,—We have been using one of your Spramotors for whitewashing purposes for some time past and find it extremely efficient for this purpose, the rapidity and economy being marked over the hand process.

We propose using it for painting our Gas-holders and other iron work, and feel sure it will result in the same economy of time and money for this use as for whitewashing.

Wishing you every success with your valuable invention,

We are, yours truly,

THE CITY GAS COMPANY,

R. W. Kidner, Sec.





N. H. HADDEN, CATAWBA ISLAND, OHIO, SPRAYING 50 ACRES OF PEACH TREES WITH SPRAMOTOR (CRUDE OIL COMBINATION USED ALONE) FOR SAN JOSE SCALE.

Not a single case of injury to any tree treated in winter has been observed; on the contrary, in a number of cases the oil seems to have acted as a stimulant, and the sprayed trees to have shown greater vigor and better foliage than those untreated.

In no case has there been any injury to fruit buds, but on this point the observations are incomplete, no early winter treatment having been made in bearing orchards. Applications made after January 15th, have in no way lessened the crop of apples and pears the year following, and applications made in March have not injured the fruit buds in peach and plum.

Crude petroleum is not suited for a summer application, either pure or diluted, because of its choking effect on foliage and its persistence.

This, however, increases its value for winter work as compared with kerosene; the latter acts at once or not at all and evaporates very soon after it has been applied—in fact, to avoid injury it must be applied in such a way as to favor rapid evaporation. Crude oil does not evaporate readily; it is penetrating, and, if applied with a brush half way round a branch, will often soak round the branch completely; it remains as an oily and greasy surface-coating for many weeks, and no scales can set on this coating within a month of the application and live; it does not ordinarily penetrate through even the surface layer of bark. Under the most unfavorable circumstances, if the outer layer is penetrated, the inner layer remains healthy, and there is no progressive injury. It does not seem to interfere with the bark functions, and young trees painted

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Deseronto, December 7th, 1900.

The Spramotor Co., London, Ont.

Gentlemen:—The Spramotor purchased from you last spring has given the utmost satisfaction, is easily operated, and does its work in a most efficient manner. For white-washing I do not think it can be surpassed as it is a great money-saver in that line. Also for syraying potatoes it loses none of its valuable points. Therefore I would most heartily recommend it to the public.

Respectfully yours,

K. DOUGLAS, (Supt.)  
The Rathburn Co. Farm, Deseronto, Ont.

with oil increased in size quite as rapidly and freely as those untreated.

Crude petroleum 39 to 45 degree gravity will kill the pernicious scale in winter whenever it comes into sufficient contact with the insect. It is a contact insecticide, and will not, does not touch; but, literally applied, it will soak through masses of scale, no matter how densely set, as nothing else will.

A minor advantage is the fact that it gives a greasy brown color to the bark, making it easy to see exactly how thorough the application has been.

It is fully as effective against scale insects as kerosene and is harmless to the most tender varieties and on the youngest trees; therefore, it is peculiarly adapted for employment against the San Jose or pernicious scale.

As the oil remains on the surface for a long time, it makes no difference whether it is put on undiluted or mixed with water. If mixed with water, the latter evaporates and leaves the oil so that the material in contact with the tree is as much undiluted as if the water had not been applied with it.

If it is put on undiluted, a fine vermorel nozzle should be used, not only because better distribution can be secured in that way, but because of the saving of material. It will be just as well, however, to use an emulsion sprayer and mix with from 60 to 75 per cent. of water. It will then be possible to use a nozzle of larger capacity, or better, a group of vermorels, and the material can be applied until everything is dripping. A gallon of emulsion containing 25 per cent. oil will give a better coating than one quart of oil undiluted.

On trunks and branches a summer application is as safe as if made in winter, and small trees or larger ones not generally infested can be summer-treated if application to the foliage is avoided.

Young scales set in large numbers on the oily surface in some places, and in a few days thereafter every one of these were dead. In other words, there is a sufficient remnant of a greasy or oily substance, probably vaseline, several months after the oil has been applied, to kill larvæ scales when they fix on the treated bark.

J. B. SMITH, Sc. D.

## N. Y. PLUM SCALE.

[BULLETIN 83.]

N. Y. EXP. STATION.

Briefly summarized, the way to combat this pest is to spray the infested tree several times—at least twice—this winter, or before April 1st, with kerosene emulsion, diluted with four parts of water. Always bear in mind that each

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St. Catharines, May 9th, 1901.

Dear Sir—Yours of the 7th to hand as to my experience in using your Spramotor for painting barns and sheds on either smooth or rough siding. I must say that it gave entire and complete satisfaction.

I will give you the size of buildings and the exact time it covered to paint them two coats. Main barn, 30 by 60. Two sheds, 20 by 45. In six hours the first coat was applied, and the second in five hours.

Thus you see the time of applying was very short. It would have taken a painter many times longer, and the cost would have been \$60.00 or \$70.00.

I used equal quantities of linseed oil and crude petroleum for first coat, and for second all petroleum with the red oxide lead, mixed some days before painting and then thoroughly screened as for using Bordeaux mixture.

I think it far easier to paint barns than to spray fruit trees. The Spramotor will put paint where no man with a brush can put it. All who have seen the work think it entirely satisfactory.

Yours very respectfully,

CHAS. E. SECORD, Box 903.

little scale must be hit with the liquid. Do not let the pest get started in force in April. If it does you cannot fight it effectively until about July 1st, then the young are hatching, and while they are wandering about on the branches for a few days they can be successfully destroyed by the emulsion, diluted even six or eight times. If these young scales get established on the leaves in July they will get beyond your control with a spray until November. You will be helpless against their ravages during the summer months. But the moment the leaves fall begin the work of destruction on the tender hibernating scale then exposed on the bark. Thoroughness must be the watchword if this new and most serious enemy is to be checked.

M. V. SLINGERLAND.

[BULLETIN 108.]

N. Y. EXP. STATION.

Spray infested trees once after the leaves fall in autumn, and at least twice in the spring before the buds open. Use kerosene emulsion, diluted four times; the application cannot be done too thoroughly, each little scale must be hit.

M. V. SLINGERLAND.

**THE CURCULIO**—This insect is perhaps the worst and most difficult the plum grower has to encounter. It is the cause of the worminess and premature dropping of the fruit. It also breeds in peaches, nectarines, apricots, cherries, pears and apples. The adult insect appears in spring, about the time of blossoming, and feeds upon the foliage and flowers until the fruit is "set," when it attacks the young plums, gnawing at them to satisfy its hunger, and cutting crescent-shaped marks in its skin in which to deposit its eggs. In a short time these eggs hatch into little grubs that feed upon the pulp of the plum and gradually work towards the pit. In a few weeks they become full grown, by which time the plums are on the ground. The larvæ then leaves the fruit and enters the ground and pupæ to come forth the following spring to continue the work of destruction. Spray as per spray calendar.

"The Spramotor was exhibited at our Waterloo meeting by Mr. Heard, who also exhibited a new Plunger that is of the greatest value in lessening the work of pumping, besides making the pump do better work than ever."—*Canadian Horticulturist*, Jan. 1, 1898.

Remember we have a perfect knapsack spray outfit. You do not have to wear a rubber coat or get wet.

Kerosene mechanical mixtures are applied with our Combination Spramotor.

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DELAWARE COLLEGE, AGRICULTURAL  
EXPERIMENT STATION.

E. DWIGHT SANDERSON,  
Entomologist.

Newark, Del., Oct. 14, 1901.

Mr. W. H. Heard,

Mgr. of Spramotor Co., London, Ontario:

Dear Sir,—We have been very much pleased with the Spramotor outfit you sent us last spring, and I have recommended it to several parties. The pump gives a more constant and higher pressure with less labor on the part of the operator than any other kerosene pump we have used. The outfit is especially adapted to the work we are doing in spraying a combination of Paris Green, Bordeaux Mixture and Kerosene, a mixture which we believe will be found useful in many cases where it is desired to spray for biting and sucking insects and fungus diseases at the same time.

Very truly yours,

E. DWIGHT SANDERSON.



# PEACHES.

## WHITEWASH AS WINTER PROTECTION OF THE PEACH.

[BULLETIN 38.]

MISSOURI EXP. STATION.

1. In this latitude winter killing of the fruit buds of the peach is usually due to the unfavorable effects of freezing after they have been stimulated into growth by warm weather, during winter or early spring.

2. This early swelling and growth of the buds is due to the warmth they receive, is practically independent of root action, and may take place on warm sunny days in winter, while roots are frozen and dormant.

3. Peach fruit buds may safely endure a temperature of ten or twenty degrees below zero, provided they mature well in autumn, are entirely dormant, and the cold comes on gradually.

4. Zero weather may kill fruit buds that have swollen during previous warm days, or that were not properly ripened in the autumn.

5. Shading or whitening peach trees to prevent their absorbing heat on sunny days, opposes growth of the buds and is consequently a protective measure.

6. Shading the trees with board sheds enable peach buds to survive the winter uninjured, when 80 per cent. of



SHOWING DIFFERENCE IN TIME OF  
BLOSSOMING WHITENED AND  
UNWHITENED BUDS.



(A)

(B)

Sections of unwhitened (A) and whitened (B) buds of Heath Cling Peach, taken March 20th, 1896, showing that the unwhitened bud had swollen and grown considerably and had an imperfect pistil, while the whitened bud was nearly dormant and had a perfect pistil.

unprotected buds were killed. Trees protected in this way blossomed later, remained in bloom longer, set more fruit in proportion to the number of apparently protected flowers, and held their fruit better than any other fruit on the station grounds. This is the most effective means of winter protection tried at the station, but it is probably too expensive for commercial orchards.

7. Whitening the twigs and buds by spraying them with whitewash is, on account of its cheapness, and beneficial effects, the most promising method of winter protection tried at this station.

8. Whitened buds remain practically dormant until April, when unprotected buds swelled perceptibly during warm days late in February and early in March.

A whitewash composed of 50 pounds of quick lime to the barrel of water, with a pound of salt to three gallons of mixture, one-fifth skimmed milk is recommended. Two coats applied shortly after Xmas, just as wood needs two coats to cover it well, then the whitening should be repeated as often as it was washed off the trees, the cost is about the same as spraying for fungi. Four applications is about right to keep the tree thoroughly whitened throughout the winter.

J. C. WHITTEN, Hortic.

## FUNGUS DISEASE.

**PEACH CURL** occurs in nearly all parts of the country, and is much worse some seasons than others; on this account it is more difficult to treat. We never know when to expect it, and are, therefore, not able to adopt preventive measures.

### Remedies.

1st. Spray thoroughly with strong Bordeaux Mixture, just previous to the swelling of the buds, late in March, or very early in April seems desirable in this latitude (New York).

2nd. Spray again with weaker Bordeaux Mixture, as soon as the petals of the flower have fallen, or after the work of the bees is over.

3rd. Spray again with weak Bordeaux, when the first leaves are just full grown, or at just about the time that the spores of the fungus are developing.

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### THE FINCH WOOD PRESERVATIVE AND PAINT CO.,

34-36 Atlantic Ave., Toronto.

London Spramotor Co.:

Gentlemen,—We have used your sprayer in painting and whitewashing with very satisfactory results, having whitewashed a house in this city, 20 feet high and 30 feet long, in thirty minutes.

We painted a fence for the Ontario Wind Engine and Pump Co'y, Toronto, 95 feet long and 7 feet high, in five minutes; also a large bank barn for B. F. Bulls, Esq., near Brampton, in three hours.

The sprayer is particularly good for painting shingle roofs, as it drives the paint under the shingles as well as on the surface.

We painted with a brush 25 squares of rough boards, which took 30 gallons of paint. We also painted 30 squares of rough lumber with the Spramotor, which only used 30 gallons of paint.

The cost of painting an ordinary sized barn with a sprayer is as follows:

30 gallons of paint, at 65c per gallon.....	\$19 50
Boy half a day to work pump.....	50
Man half a day to hold rod .....	1 00
Total.....	\$21 50

Yours truly,

FINCH WOOD PRESERVATIVE AND PAINT CO.,

Toronto.

Experiments carried on in 1898 by Wm. M. Orr, Superintendent of Spraying Experiments at Fruitland, Ont., from *Canadian Horticulturist* for January, 1899:—

"There was a considerable amount of curl leaf on the trees in 1897, and for fear of a recurrence of the disease in 1898 we decided to treat them with Bordeaux mixture. In April we sprayed the whole orchard excepting one side of each of three rows, and gave a second application in May. The mixture used in both cases was of standard strength, and each barrel was tested with the ferrocyanide of potash test.

"The application made in April while the trees were dormant caused no injury, but in May, after growth had started, it injured the twigs badly on the narrow-leaved varieties, the Longhursts dropping almost all their foliage and fruit. The fallen foliage appeared perfect, the trouble being apparently with the twigs, which afterwards shrivelled and died. No damage was done to broad-leaved varieties.

"Otherwise than the damage referred to the work was satisfactory, as the orchard was only very slightly affected, while the sides of the three rows which were not sprayed were badly diseased.

"On the trees which were whitened throughout the winter in addition to the Bordeaux sprayings, scarcely a curled leaf could be found.

"To avoid a repetition of the damage to the foliage this year we will use only two lbs. of copper sulphate to 40 gallons of water when we spray in April and May."

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## INSECTS.

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**THE BLACK APHIS**—Great numbers of this small, shiny black insect may be seen in the spring on the leaves and twigs of the Peach, both in the orchard and the nursery. The lice often do a great deal of damage above ground as well as below on the roots.

**Remedies**—For the form above ground, spraying with kerosene emulsion—one gallon to thirty-three gallons of water—is the most effective remedy. The first spraying should be made as soon as the lice appear. If necessary this should be followed by others, at intervals of a few days, until the trees are rid of the pest. Under ground the lice are best destroyed by digging in tobacco stems or dust around the trees. The tobacco is scattered on the ground to the depth of half an inch or more, then dug in with a spade or fork.

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Every process in building the Spramotor is under the most careful system of testing and inspection, insuring uniformity.

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### THE CANADA PAINT COMPANY.

Montreal, January 27th, 1899.

Messrs. Spramotor Co., London, Ont.:

Dear Sirs,—Replying to your inquiry of the 25th inst., the whitewashing outfit recently had from you has been used by us to tint the walls and ceilings of the greater part of our Montreal factory and packing rooms. By employing two lads we were able to tint seven extensive floors in as many days, and were agreeably surprised to find with how little effort and how tidily the work was accomplished.

We feel that this first opportunity of using your Spramotor has already refunded us the entire cost of the outfit.

Yours truly,

THE CANADIAN PAINT CO., LIMITED,  
Rob. Munro, Managing Director.

# GRAPES.

## FUNGUS DISEASES.

### GRAPE ROT OR POWDERY MILDEW

—Use Bordeaux mixture—sure preventive.

**Treatment**—As a first step every precaution should be taken to remove as much of the infectious material as possible. With this object in view the old leaves and rotten berries should be carefully collected in the fall or winter and burned or buried. Trimmings should also be burned as they often harbor thousands of minute spores or productive bodies of the fungus. The Bordeaux mixture has proven beyond a doubt to be the most reliable preventive to Black Rot. In all cases it must be remembered that these treatments are preventives, and being such, it is sheer folly to wait until the enemy appears before beginning to fight.

In the spring, after the vineyard has been pruned and put in order by the plough, but before vegetation starts, spray the vines thoroughly with the Bordeaux mixture. The object of this spraying is to destroy any spores of the fungus that may be hidden away in the crevices of the bark. About ten days before the flowers open, spray all the green parts of the vine with the Bordeaux mixture, taking care to wet the foliage thoroughly. Spray again with the same preparation when the flowers are opening, repeating the operation every three weeks until the fruit begins to color. The necessity of beginning treatment early cannot be too strongly urged.

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## INJURIOUS INSECTS.

**THE FLEA BEETLE** — A small steel-blue insect, is quite abundant and destructive throughout the country. It appears in early spring and at once begins eating the tender foliage.

After about a month the female beetle deposits small yellow eggs on the foliage. These soon hatch into small larvæ, which continue the work of destruction.

**Remedies**—Spray with Paris Green, one pound to 200 gallons of water, as soon as the beetles are noticed. Two applications of this solution at intervals of a week or ten days will usually destroy all the insects.

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Orchardside, Dunbar P. O.

Spramotor Co., London, Ont.

Dear Sirs,—I have tested a number of spray pumps and am thoroughly satisfied that the Spramotor is the pump with a capital THE.

Last season I sprayed 400 trees in one day. My daughter, a slight girl, both drove the horse and pumped the Spramotor without the slightest sign of fatigue.

This work was done on Lot 13, Concession 8, of the Township of Williamsburg, County of Dundas, Province of Ontario.

Any enquirers that refer to me I will convince them of the ease of operating and the efficiency of spraying with the Spramotor machine. Wishing you very large sales,

I remain, yours truly,

GEO. H. McMILLAN.



## THE QUINCE.

**LEAF BLIGHT AND SPOTTING**—The Quince is especially subject to these diseases, both of which are due to the same cause. The same fungus also causes the leaf blight and cracking of the pear.

**Remedies**—Spray the trees with Bordeaux mixtures first when the flowers are falling. Spray again when the fruit is the size of peas, repeating the operation at intervals of two weeks until four or five treatments in all have been made.

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## CURRANT.

**THE IMPORTED CURRANT WORM**, in its perfect form, is a small fly which lays its eggs on the leaves in early spring. As soon as the eggs hatch the worms eat circular holes in the foliage. As the worms increase in size they become more voracious, often ridding the tree of its leaves.

**Remedies**—A careful spraying with Bordeaux mixture and Paris Green, 4 oz. to the barrel, after the fruit is set, will protect the bushes. If they infest when the fruit is first turning, spray with fresh hellebore, at the rate of one half oz. to the gallon of water. Same treatment will answer for the gooseberry.

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**THE CURRANT APHIS** attacks the leaves, causing them to curl and turn brown. The lice are usually abundant in early summer, but as hot weather advances they disappear.

**Remedies**—Spray with kerosene emulsion—one gallon to twenty gallons of water, as soon as the lice are noticed.

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## RASPBERRY.

**ANTHRACNOSE** has of late years attracted considerable attention. It occurs on the stems, causing whitish spots, which are usually surrounded by a purplish border. These spots, which extend into the cane, often completely incircle the latter, thereby cutting off the supply of nourishment, and as a result causing the fruit and leaves above to wilt and finally dry up entirely.

**Remedies**—As soon as growth starts in spring, spray with Bordeaux mixture, half strength, i.e., 3 pounds

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### PICTON ISLAND FARM AND POULTRY YARDS.

This Island contains 400 Acres.  
Black Diamond Gardens and Frontenac Dairy.  
300 Acres on Grindstone Island.

Clayton, New York, April 16, 1901.

The Spramotor Co., London, Ontario, Canada:

Gentlemen,—The three sprayers and extras came to hand to-day. I have tried one of them, and find it superior to anything I ever used or seen. Your pump seems to hold the pressure at an even point, and the spray is grand.

I wish you would send me book on spraying and directions for whitewashing and painting. I would like to try these two things at once. I enclose stamps for same. Your bill has gone to our bank for payment.

D. E. HOWATT, Manager.

of copper sulphate, 2 pounds of lime to 22 gallons of water. Repeat the operations at intervals of ten days until the first fruit begins to color. After the fruit is out of the way, if the disease seems to be on the increase, continue the treatment at intervals of two weeks until the middle or latter part of August.

**LEAF BLIGHT** is often very destructive to raspberries, especially in the West. The leaves show at first numerous brown spots. These soon run together and eventually the leaf turns brown and dries up.

**Remedies**—The same treatment recommended for anthracnose will answer here.

"The first application should be made early in the spring, before the leaves open, at which time the spraying should be thoroughly done. The second application should be made soon after the young canes appear above the ground, and the spray directed to them alone. The third application is to be made about two weeks from the date of the second, taking the same precaution to spray the young canes principally. The fourth and last application should be made just previous to the time of blooming, in the same manner as advised for the second and third sprayings. Raspberry leaves are very tender and the mixture may injure them slightly, but not enough to preclude its use, especially if some care is taken to keep it off the leaves of the bearing canes. The leaves on the young shoots of the current season's growth are not so easily harmed, hence no pains need be taken to keep it off them."

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## STRAWBERRY.

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### FUNGUS DISEASES.

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**LEAF BLIGHT OR RUST** of the Strawberry is familiar to everyone. The disease occurs throughout the entire country, making its appearance in early spring in the form of whitish or purplish spots on the leaves. Eventually the entire leaf dries up into a brown mass.

**Remedies**—In spring, soon after the leaves start, spray the plants with ammoniacal solution or eau celeste. Repeat the treatment at intervals of ten days until the berries begin to turn. After all the fruit is off and the beds have been thoroughly put in order by the plow and cultivator, begin the spraying again, and continue at intervals of two weeks until the middle of September. Beds treated in this way usually preserve their foliage perfectly, and, as a result, large, perfect crowns are made, thus insuring a good crop the following season.

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#### MICHIGAN STATE HORTICULTURAL SOCIETY.

R. M. Kellogg, Three Rivers, Pres.	Executive Board :
R. J. Coryell, Detroit, Vice-Pres.	C. J. Monroe, R. J. Coryell,
C. E. Bassett, Fennville, Sec.	C. F. Hadsell, Thos. Gunson,
A. W. Slayton, Gr'd Rapids, Treas.	C. F. Hale, C. B. Welch.

Office of President, Three Rivers, Mich., Feb. 13, 1902.  
Spramotor Co., Buffalo, N. Y.

Dear Sir,—While in attendance at Western New York Horticultural Meeting, I examined your Spraying apparatus in all its bearings, and while I have a first-class pump, I yet find yours are so near the ideal in all its parts that I cannot resist the temptation to order your No. 2, with all parts, brass and brass rods, which ship as soon as convenient.

I frankly say I have never seen so perfect an equipment for spraying.

Very truly,

R. M. KELLOGG.

[BULLETIN 79.]

N. Y. EXP. STATION.

The disease is also readily controlled by thorough sprayings with Bordeaux mixture. If the attack has been pronounced the preceding year the first spraying should probably be given in the spring, before the flowers appear. Ordinarily the first treatment may be given as soon as the berries are picked, and the applications should be repeated two or three more times, as occasion seems to demand.

L. H. BAILEY.

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## GOOSEBERRY.

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**POWDERY MILDEW, OR MILDEW** as it is usually called, occurs wherever the gooseberry is grown. It attacks the young growth, covering it with a thick, felted, greenish coat. The fruit is also frequently attacked, the surface being completely covered with the cob-web like thread of the fungus.

**Remedies**—Spray the plants as soon as growth starts, with a solution made by mixing half ounce of the concentrated liver of sulphur fluid in five gallons of water. Repeat the treatment every ten or twelve days until seven or eight in all have been made. Aside from the labor the cost of the treatment is very little. If our Spramotor is used—such as we describe in this catalogue—large plants can be sprayed in a moment.

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## POTATOES.

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### POTATO SPRAYING.

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SCHOOL OF PRACTICAL AGRICULTURE  
AND HORTICULTURE.

Briarcliff Manor, Feb. 11th, 1902.

"Last year we began spraying potatoes when they were not over four inches high, it being an unusually unfavorable season. We continued spraying much oftener than would ordinarily be required, spraying after every heavy rain, which required us to make application about six times. We used Bordeaux mixture and Paris Green, one pound of Paris Green to 100 gallons of water. Our yield of potatoes was about four times the average yield of that of the country."

"When the potatoes about us were black, and the foliage entirely gone, we held ours up until we secured a very satisfactory crop. This year I think we shall use Arsenate of Lead in place of Paris Green, as it holds better in solution and remains longer upon the foliage. After the vines have been perceptibly attacked by blight it is of no use to spray, the work must be done entirely in advance, and on the principle of insurance. The foliage must be protected against the conditions which cause

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J. B. KING & CO.,  
Buffalo Branch, 322 West Genesee St.,  
Chas. C. Calkins, Manager.

Buffalo, N. Y., April 1st, 1901.  
The Spramotor Co., 109 Erie St., City.

Gentlemen,—We take great pleasure in recommending your Spramotor machine for applying both cold water and lead and oil paints.

We have experimented with several paint machines, but in our experience we consider yours to be the best of any thing that has come to our notice.

Yours very truly,

J. B. KING & CO.

*"Best to cast your bait in a pond that is not fished dry."*

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blight, hence spraying must be done regularly, regardless of the season. The number of times the application will be made can only be determined by the character of the season.

GEO. T. POWELL, Director.

No farmer can afford the loss of one-third of his crop. Yet potato growers who do not use Bordeaux Mixture often lose more than this. The results of the eight years' trial at the Vermont Experiment Station show average yields of 296 bushels an acre where sprayed and 173 bushels where not sprayed. It pays to spray potatoes if done rightly. The practice of the Vermont Experiment Station is to use Paris Green for the beetles during June. During July and August two or three applications are made of Bordeaux-Paris Green Mixture. This mixture consists of six pounds copper sulphate, four pounds lime, one-half pound Paris Green, one barrel (40 or 50 gallons) water. Slack the lime and dilute with about one-half the water; dissolve the sulphate in the other half, then pour this vitriol solution into the lime water, meanwhile stirring thoroughly. Add the Paris Green and the mixture is ready for use.

F. A. WAUGH.

**EARLY BLIGHT**—As the name indicates this usually makes its appearance early in the season and upon early varieties of potatoes. Hot dry weather favors its growth, and it is usually most severe in its attacks where the potatoes are planted on dry soil. It will, however, make its appearance when the weather is moderately cold. Whenever the potato foliage has been injured by the flea beetle it seems to be predisposed to attacks of the early blight, the spores finding a favorable resting spot on the injured places of the leaf. Any condition or treatment which has produced a weakening of the plant causes it to be more likely to attacks of blight. Strong, healthy growing plants may be entirely free from attack, while plants which have for any reason been checked in their growth falls an easy prey to the disease. While this early blight does not cause the potato to rot, it so injures the foliage that the growth is checked long before maturity, and instead of the potatoes being full grown they are undersized and immature. It is very possible for the early blight to attack a field of potatoes and its presence never be recognized by the farmer, it being taken for a case of early maturity. This may be the reason the early blight fails to attract as much attention as the late blight, and it no doubt does far more damage than is generally accredited it.

**LATE BLIGHT**—This is a fungus disease which is responsible for the potato rot of the present season in New York State. Its appearance is well known. The most interesting feature connected with the fungus is the wonderful energy which it exhibits, under favorable conditions, in the destruction of the plants. It sometimes spreads with such rapidity that a crop may be ruined in one or two days. A moist atmosphere and a temperature

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ONTARIO ELEVATOR,

178 ERIE STREET,  
BUFFALO, N. Y.

The Spramotor Co. : Buffalo, N. Y., August 7th, 1901.

Gentlemen,—In reply to your inquiries concerning the Spramotor, purchased from you by the Ontario Elevator, I will say that we have used it for whitewashing, and that it gave perfect satisfaction, doing all that was claimed for it. I think it would work equally well if paint were used.

Yours, etc.,

CHAS. BARTHOLEMY,  
Superintendent.



of 70 degrees F., are most favorable to the spread and development of the disease.

**Remedies**—From two to four barrels of Bordeaux mixture, to which is added four ounces of Paris Green per barrel, if the bugs are young, and six ounces if they are large, will be required for an acre, according to the size of the vines.

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## INJURIOUS INSECTS.

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**COLORADO POTATO BEETLES** can be effectually killed with four ounces of Paris Green per barrel if the bugs are small, and six ounces if they are large. Always apply it with the Bordeaux mixture, and kill the blight at the same time.

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## CABBAGE.

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### INSECTS AFFECTING.

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Under this heading may be mentioned the green imported worm, familiar to all in Canada; the cabbage plusia, or southern worm, which is also green, but differs from the first in being a looper; the zebra caterpillar, which is striped with yellow and black markings.

**Remedies**—All these worms succumb readily to kerosene emulsion, which should be applied at the rate of 1 gallon to 15 gallons of water.

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**THE CABBAGE APHIS**—Of a greenish color, causes a great amount of injury to plants. Leaves are often seen covered with the lice.

**Remedies**—The same treatment recommended for cabbage worms is applicable here.

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## SUGAR BEET.

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### DISEASES.

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CORNELL UNIVERSITY AGRICULTURAL  
[BULLETIN 163.] EXPERIMENT STATION.

"There is every reason to believe that by beginning the spraying early, the leaf-spot may be almost entirely prevented by the use of Bordeaux fungicide. If the disease continues so disastrous as it was in certain sections during the past season, for success, growers must expect to spray their beets with the same regularity as has been found necessary in growing potatoes. The standard formula for the Bordeaux Mixture should be used."

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Cummings Bridge, Sept. 23rd, 1898.  
Messrs. Spramotor Co., London, Ont.

Sirs,—I received your Spramotor No. 2 on July 1st, 1897. Have used it in different ways and always found it to do the best work to my entire satisfaction. The potato sprayer is an entire success. Your machinery does better work than any I have ever seen. I would be willing to pay the price of a machine every year, if necessary, but the machine is as good as ever, and I have done nothing to it yet in the way of repairs.

Wishing you every success, I remain, yours truly,

J. C. McMULLEN & CO.

# TOMATO.

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## FUNGUS DISEASES.

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**BLIGHT AND ROT OF THE TOMATO,** while not due to the same fungus as that causing blight and rot of the potato, may, nevertheless, be treated in the same way. A disease called blight is sometimes quite troublesome to plants under glass.

**Remedies**—For blight and rot in the field spray with the Bordeaux mixture as soon as the plants begin to flower. Repeat the sprayings at intervals of twelve to fifteen days throughout the season.

Blight of foliage under glass is best prevented by spraying with Bordeaux mixture as soon as the yellowish spots characteristic of the disease are noticed. The spots usually have a greenish, felt-like appearance on the under side of the leaf, while the upper portion becomes a pale yellow. Two or three sprayings of the Bordeaux mixture at intervals of eight or ten days usually effectually check the trouble.

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## MISCELLANEOUS.

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**ASPARAGUS BEETLES**—Two new pests of the asparagus have arrived in Ontario in the Niagara region during the past year. These are the common and the 12-spotted asparagus beetles.

The former is a steel blue beetle, with white spots, and the latter is a reddish beetle with black spots.

The adult beetles appear about the first week of May, and soon deposit eggs on the shoots. The grubs which hatch from the eggs in a week are slug-like, and resemble somewhat the grubs of the potato beetle, but are grey instead of yellow. The grubs feed for nearly two weeks on the tender asparagus shoots, when they change into the pupa state. Ten days later the adult beetles emerge from the ground and begin to lay eggs for a second brood.

**Remedies**—1. All asparagus plants are cut down in early spring so as to force the beetles to lay their eggs on the new shoots, which are cut regularly every few days. In this way the eggs have not time to hatch.

2. Some shoots may be allowed to grow during the cutting season to serve as traps, and at intervals sprayed with Paris Green, or cut and burned before the grubs develop. In all cases the beds should be thoroughly sprayed with Paris Green (4 ozs. in a barrel of water) in the cutting season. PROF. WM. LOCHEAD, B.A., M.S.

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**SQUASH BUG**—Use one tablespoonful of kerosene incorporated with two quarts of gypsum (Plaster of Paris) and spray on the vines. One application may serve for a season, but repeat if the bugs are seen to return.

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OFFICE OF McNEIL BROS., VINEYARDISTS.

Windsor, April 20th, 1896.

Spramotor Co., London, Ont.

Gentlemen,—I can offer no suggestions to improve your Spramotor apparatus. The more I use it the better I like it. The agitator is quite sufficient. There is no leather about the pump to harden, and the valves and the plunger work airtight and yet without friction, and are practically indestructible, and lastly, all the parts are very strong all through.

Yours truly,

A. McNEIL.

**ROSE BEETLE, CHAFER OR BUG**, has recently attracted widespread attention by its attacks on the grape. It makes its appearance early in the summer, devouring flowers, young fruit and leaves. The beetle is about half an inch long, and of a brown color.

Use pyrethrum or buhach (liquid form). A tablespoonful to two gallons of water. Apply with the Spramotor knapsack. Here, as in all cases, the liquid must be applied with a great force, so that the liquid will reach all parts and touch each insect.

Spray before blossoms open with Paris Green—one pound to fifty gallons of Bordeaux mixture.

**ROSE SLUG, OR ROSE DANE FLY**—Kerosene Emulsion. The importance of gaining a practical knowledge of the habits of this insect is manifest, and it is a matter of immediate and vital interest to all fruit growers to know that a treatment, which promises to be successful, has been discovered, and is already being used to a considerable extent.

**ROSE-LEAF HOPPER**—Kerosene Emulsion. Apply with Spramotor.

**HOP LICE**—From *Farm and Home*, by Prof. J. A. Lintner, State Entomologist, of New York: "The attack of this species should be closely watched by hop growers, and if it proved formidable the following is the best remedy that can be used. With the aid of the Spramotor go through the yard and spray the underside of the leaves with kerosene emulsion, which is prepared by thoroughly mixing, by the aid of an apparatus, two gallons of kerosene with a hot solution of one pound of soap in one gallon of water. One part of this substance should be diluted with 20 or 25 parts of water. With this preparation the injury to the foliage was none at all, and all the lice were killed. One hundred gallons of this wash would cost about 30 cents. With this treatment the ravages of the hop louse may easily be prevented. In future do not charge the loss upon 'Providence.'"

**THE COW HORN FLY** — Prof. Fletcher, Dominion Entomologist, claims that these pests worry cattle and cause them to fall off one-half in the yield of milk and butter. He recommends every farmer to purchase a Spramotor, drive the cattle into an inclosure and spray them with kerosene emulsion. With our No. 2 (double nozzle) apparatus any man can spray a drove of cattle in a few minutes by driving them through a narrow passage.

"In my experience the best results have been secured by the use of a mixture of seal-oil and crude carbolic acid. One tablespoonful of crude carbolic acid added to a quart of seal-oil or fish-oil. This is applied either with a Spramotor or with a brush."

PROF. W. LOCHEAD, B.A., M.S.

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H. COREY, PRODUCER AND DEALER IN CRUDE PETROLEUM AND ITS PRODUCTS. RAILWAY OILS A SPECIALTY.

Petrolea, Ont., Feb. 18th, 1898.  
Spramotor Co., London, Ont.

Dear Sirs,—Replying to yours of the 16th, I beg to add my mite of praise to your spraying apparatus. The machine purchased from you last year did excellent service, both in the orchard and whitewashing cellars and inside of stables, etc. I found it a complete success in point of economy and despatch in using light colored oxide of iron and crude petroleum oil as a paint mixture. My men manipulating paint and machine were not experts, but they would paint over an ordinary sized barn in an hour's time.

Yours faithfully,

H. COREY.

**HORSE LICE**—Two kinds: Sucking horse lice and biting horse lice. Same treatment as for cattle louse.

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**CATTLE LICE**—Three kinds: Short-nosed ox louse (a sucking louse), long-nosed ox louse (a sucking louse), and biting ox louse.

**Remedies**—Apply kerosene emulsion with the Spramotor, rubbing it in thoroughly with the finger tips at the same time. It kills the lice and leaves the hair in good condition.

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## SPRAYING TO KILL WILD MUSTARD.

*(Also known as Herrick and Charlock.)*

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The spraying experiments carried on by order of the Department of Agriculture, by Prof. M. W. Doherty, B.S.A., M.S., during 1900, has demonstrated the effectiveness of a spray of 10 lbs. Bluestone to 40 gallons of water.

The experiments were at Whitby, June 10th; Foxboro', June 12th; Picton, June 14th; Andrewsburg, June 16th; Dorsetville, June 21st. The results are reported by the parties on whose premises the experiments took place:

Whitby, August 20, 1901.

One thing is certain, the Sulphate of Copper will kill the mustard without injury to the oats, barley or wheat.

R. J. HUGGARD.

Dorsetville, August 23, 1901.

I am fully convinced that spraying will destroy all mustard, and the crop will be sufficiently increased to pay all expenses in connection therewith.

J. A. SPRAGUE.

Picton, August 9th, 1901.

In the fields where the plants were small I could find no traces of the mustard, as the sun had dried them up.

W. L. YEREX.

Foxboro', July 24, 1901.

Both Mr. Thrasher and myself think the operation a success. There was no injury to the crop. Now the crop is better where it was sprayed than where it was not sprayed.

THOMAS HOLGATE.

Andrewsville, September 1, 1901.

The mustard was killed, and with no apparent injury to the crop (oats and wheat). I am sure the increase in the yield by spraying more than covered the expense connected with it.

L. H. NEWMAN.

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### The Method Described.

After four years of experimenting with the "Bluestone method" of destroying that noxious weed, commonly known in our western counties as "wild mustard," and in the East as "Herrick," we can, without the least hesitation, recommend it to farmers whose fields are badly infested. In places where the mustard plants are sufficiently rare to admit of hand-pulling, it will not pay to

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THE CARLING BREWING & MALTING CO., LIMITED.

London, Canada, Aug. 18th, 1897.

The Spramotor Co., London.

Gentlemen,—We have pleasure in stating that the Spramotor purchased from you some time ago is giving us every satisfaction, and we have no hesitation in saying that where a large amount of whitewashing is to be done, this machine is invaluable for the purpose. We have much pleasure in recommending its use, particularly in breweries where whitewashing is an absolute necessity.

Yours sincerely,

THE CARLING B. & M. CO., Limited.

T. H. Carling, Mgr.



spray with Bluestone solution. However, there are thousands of acres of fertile land in this Province which have become so badly infested that hand-picking is impossible. To these we would say, take up this new method and go systematically to work to rid your farm of this pest, which is each year drawing from your fields enormous quantities of valuable plant food, and is the source of constant eye sore.

The method is practicable where the ground is sown to oats, barley or wheat, and no injury will result either to the crop or to the young clover or timothy plants, should it be "seeded down."

### **A.—Time to Spray.**

The exact date of spraying, of course, cannot be given, owing to the variations of weather in our seasons. However, the exact stage in the development of the crop and the mustard at which the spraying is most effective has been ascertained. If it is the intention to make but one application the solution should be applied after the mustard plants have produced a considerable leaf surface, but before they come into bloom. It is true that the mustard plants at this stage are not so susceptible to the spray as when they are less developed, but if the spraying is done in this earlier stage a second application is made necessary, because of the fact that the crop will not be far enough advanced to smother out the young mustard seedlings which will make their appearance after the operation. If the spraying is delayed until after the mustard comes into full bloom some of the plants will mature seed, and in this way lessen the effectiveness of the treatment. The spraying should be done on a calm, bright day. A heavy storm of rain coming immediately after the operation will make a second spraying necessary.

### **B.—Preparation of Solution.**

Place ten pounds of copper sulphate, or bluestone, in a coarse bag and suspend in about three gallons of boiling water. The crystals will be entirely dissolved in from fifteen to twenty minutes. Strain this solution into the pump barrel, and fill up with cold water to forty or fifty gallons. Apply this quantity to each acre.

### **C.—Method of Applying Solution.**

The best method of applying the solution is with an ordinary "Barrel Spray Pump," such as is used for the spraying of fruit trees. Place this in a cart or light wagon and drive slowly through the fields, applying the chemicals in such a way that all the mustard plants will be wetted. The bamboo rod attachment, with a two or three nozzle cluster, will do the work effectively but not so rapidly as the "extension rod" device attached to the back of the cart or wagon. Your results will depend almost entirely upon the thoroughness with which you do the spraying.

### **Some Advantages of this Method.**

1. It is practicable when hand pulling is not.
2. If thoroughly carried out for four years all the mustard which remains can handily be pulled.
3. It makes it possible to exterminate this pest without missing a season's crop.
4. The increase in the yield of grain which results from the increase in the fund of plant food placed at the disposal of the crop, owing to the mustard plants having been killed, will usually cover all the expense connected with the operation.
5. The original outlay amounts only to about 80c. per acre.

## FORMULAS.

### Bordeaux Mixture.

	CANADIAN.	AMERICAN.
Copper Sulphate.....	4 pounds.	6 pounds.
Quicklime .....	4	4
Water.....	50 gallons.	45 gallons.

[BULLETIN 23.]

April, 1895.

To destroy self-eating insects add four ounces of Paris Green. For peach, use three pounds each of copper sulphate and lime, and three ounces of Paris Green, on account of the tenderness of the foliage.

When a single barrellful of the Bordeaux mixture is required, dissolve in a coal oil barrel partly filled with water, four pounds of copper sulphate (blue stone). Hot water facilitates the operation. To dissolve quickly place the copper sulphate in a cotton bag or basket, and suspend this in the vessel containing water so that it is entirely immersed. Solution rapidly takes place. In another vessel slack four pounds of fresh lime with as many gallons of water. If the lime, when slacked, is lumpy or granular it should be strained through a fine sieve or coarse sacking into the barrel containing the copper sulphate now in solution, then fill the barrel with water and it is ready for use. It should be used soon after being prepared.

When a large amount is contemplated it is a good plan to make stock solutions separately, of lime and blue stone which can be diluted as needed; dissolve 100 pounds of copper sulphate in 50 gallons of water; two gallons when dissolved will contain four pounds of the salt. In another barrel slack 100 pounds of fresh lime and make up a milk by adding 50 gallons of water; when well stirred two gallons should contain four pounds of lime. When, as before, it is desired to make a barrel of Bordeaux mixture, take two gallons of the stock solution of copper sulphate, and add the same quantity of the milk of lime; if the lime is of good quality it will be sufficient to neutralize it completely. If the lime is air-slacked or impure, the right quantity can be ascertained by applying the ferro-cyanide of potassium test. A two-ounce bottle containing a saturated solution of ferro-cyanide of potassium, costing 5c. is all that is required for a season's work. If the lime is deficient a drop of the ferro-cyanide of potassium (yellow prussiate of potash) added to the mixture will turn brown. Add the milk of lime till the drop of ferro-cyanide of potassium remains colorless, then add a little more milk lime to make sure that the strength is uniform, and fill the barrel with water. JOHN CRAIG, Horticulturist.

[BULLETIN 177.]

N. Y. EXP. STATION, Jan., 1900.

Bordeaux Mixture is liable to injure the foliage of the Japanese plums, but no better fungicide for spraying this class of fruit is now known. To avoid injury, use a very dilute mixture.

Varieties of fruit differ in their susceptibility to injury from sprays.

Unless lime is added, a simple solution of copper sulphate, as strong as four ounces per barrel, cannot be used without injury to the foliage of many fruit trees.

L. H. BAILEY.

### Lime and Sulphate.

It is desirable to dilute both the lime and sulphate before mixing and especially important that the sulphate be poured into the lime, and not the lime into the sulphate.

F. A. WAUGH.

### Lime, Salt and Sulphur.

As an all round remedy (insecticide and fungicide) it promises very well indeed, and we shall be pleased to have as many as will join us in making further experiments next April, and report results. The proportions for this wash may be varied to almost any extent. A good pump will spray two pounds of lime to the gallon of mixture without clogging, and if the lime be good and properly slacked, there will be no settlings in the barrel. In his experiment Dr. Howard used 30 lbs. lime, 20 lbs. sulphur, and 15 lbs. salt in 50 gallons of mixture, which, with our material, makes a light covering. The proportions recommended from California are 35 lbs. lime, 15 lbs. sulphur, and 15 lbs. salt in 50 gallons mixture, and the California people suggest that a larger proportion of lime and sulphur than they use might be advantageous in the East, and that with them salt is not an essential. We find that 35 lbs. lime, 15 lbs. sulphur, and 10 lbs. salt, with enough hot water to make 30 gallons of mixture will spray very freely, and cover the tree more perfectly, and

recommend these quantities for trial. To prepare this wash, place half of the water in a large kettle, add the salt and sulphur, bring the water to a boil, throw in the lime, adding hot water from another kettle to prevent burning. boil two to three hours, increase the quantity to 30 gallons with hot water and apply while hot.

We would recommend crude petroleum, 20 to 25 per cent. with water, for apples, pears, plums, &c., and whale oil soap, full strength and quantity, for peaches.

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#### Copper Sulphate Solution.

Copper sulphate ..... 1 pound.  
Water.. .....25 gallons.

This should be used only before the foliage appears. It is easily applied, and acts as a general germicide and disinfectant. In simple solution copper sulphate is very injurious to foliage. When lime is added, as in making Bordeaux Mixture, its corrosive action is neutralized and injury to the foliage prevented. In this way a larger quantity of blue-stone may be used, and it adheres to the foliage better by the agency of the lime.

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#### Ammoniacal Copper Carbonate.

Copper carbonate ..... 5 ounces.  
Ammonia ..... 2 quarts.  
Water.....50 gallons.

The copper carbonate is best dissolved in large bottles, where it will keep indefinitely, as it should be diluted with water as required. For the same purpose as Bordeaux.

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#### Paris Green.

##### FOR FRUIT.

Paris Green.... 4 ounces.  
Water.....40 or 50 gallons.

##### FOR POTATOES.

Paris Green..... 6 to 8 ounces.  
Water.....40 to 50 gallons.

**Test of Paris Green.**—Put a small quantity into some common ammonia or hartshorn. If it be good the Paris Green will all dissolve, leaving no sediment; if not, there will be more or less sediment remaining. It is always well to apply this test before treating a large area, as but a few minutes are required to make the test, and much valuable time may be saved, for Paris Green is not always true to name.

If this mixture is to be used on peach trees, one pound quicklime should be added. Repeated applications will injure most foliage unless lime is added. Paris Green and Bordeaux can be applied together with perfect safety. The action of neither is weakened, and the Paris Green loses all caustic properties. For insects which chew.

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#### Arsenite of Lead.

Arsenite of lead..... 1 pound.  
Water.....150 gallons.

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#### Hellebore.

Fresh white hellebore.....1 ounce.  
Water.....3 gallons.

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#### Kerosene Emulsion.

Hard soap.....½ pound.  
Boiling water. .... 1 gallon.  
Kerosene..... 2 gallons.

Dissolve the soap in hot water, add the kerosene, and churn with a pump, by directing the nozzle into the solution for five or ten minutes until it emulsifies (or becomes of a thick, creamy consistency). This is the stock emulsion, and will remain in this state indefinitely. It must be diluted with water according to directions. From four times for the San Jose Scale, when the leaves are off, to 20 times for Aphids. For insects that suck, cabbage worms, and all insects that have soft bodies.

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#### Arsenite of Lime.

This insecticide is coming more into popular favor yearly, and is worthy of it. Arsenite of lime is at least one-half cheaper than Paris Green, is equally efficient, and will not burn the tenderest foliage at the strength ordinarily applied. To make 800 gallons of spraying mixture:

White arsenic.....2 pounds.  
Sal. soda .....8  
Water .....2 gallons.

*"Relatives are always willing to lend trouble."*

Boil all together for 15 minutes, or till the arsenic dissolves. One pint of this stock solution and 2 lbs. of slacked lime, added to a barrel of water, is equal in insecticidal value to one-quarter pound of Paris Green, and costs half as much. Arsenite of lime ought to be used more generally in place of Paris Green.

#### Resin Lime Mixture.

In spraying for chewing insects on plants with smooth leaves, as cabbage and cauliflower, it is difficult to make the poison adhere. This may be overcome by using the arsenite in the following material:

Pulverized resin .....	5 pounds.
Concentrated lye .....	1 "
Fish oil (or other animal oil, except tallow) .....	1 pint.
Water .....	5 gallons.

Heat oil and resin with a gallon of water till the resin is softened. Add lye and remaining 4 gallons of water and boil about two hours, or till mixture will unite with cold water. Add water to make 5 gallons of this stock solution. When needed for spraying take:

Resin mixture .....	1 gallon.
Whitewash .....	3 gallons.
Paris Green .....	$\frac{1}{4}$ pound.
Water .....	16 gallons.

#### Kerosene Emulsion and Mechanical Mixtures.

Oil and water applied with the Spramotor Combination will prove better than Kerosene Emulsion, as it is easier to apply. For scale insects use  $\frac{1}{2}$  to  $\frac{1}{4}$  oil, and for mealy bugs, lice, and thrips, one-twentieth of oil in the combined mixture is best. All soft bodied insects can be treated successfully.

#### Tobacco.

Boil tobacco stems, and use at the rate of 2 gallons to each pound of stems, for sucking insects.

#### Prices of Chemicals for Spraying.

In order to save our patrons trouble in getting the main chemicals required in Spraying, we have concluded to give prices for strictly fresh and first-class goods. In lots of five pounds or more, FOR CASH ONLY.

Copper Carbonate, per lb .....	\$0.40.
Copper Sulphate, .....	.08.
Paris Green (Can. Gov't standard) per lb .....	.20.
Fresh White Hellebore, .....	.20.
Corrosive Sublimate, .....	1.25.

We will ship the above at any time and on short notice. Special prices for larger lots.

#### Cautions.

Do not mix the copper preparations in iron or tin; always use wood, brass or earthen vessels.

Study carefully the nature of the insect or disease, and select the remedy that is most likely to destroy it without danger of injuring the plants.



THE SPRAMOTOR AT WORK AT THE MURALD CO.'S WORKS,  
SLATTER ISLAND, NEW YORK, N. Y.



# Spray Calendar.

Although much has been written on the subject of spraying, the information is so scattered that it cannot be readily brought together. In the preparation of this calendar, the most important points regarding sprays have been selected and arranged in such a manner that the grower can see at a glance what to apply and when to make the applications. The directions given here have been carefully compiled from the latest results obtained by leading horticulturists and entomologists; they may be followed with safety.

NOTICE—In this calendar it will be seen that some applications are italicized, and these are the ones which are *most important*.

By E. G. LODEMAN, *Asst. Horticulturist,*  
*Cornell University Exp. Sta., Ithaca, N. Y.*

PLANT.	FIRST APPLICATION.	SECOND APPLICATION.	THIRD APPLICATION.	FOURTH APPLICATION.	FIFTH APPLICATION.	SIXTH APPLICATION.
APPLE..... (Scab, codling moth, bud moth.)	When buds are swelling, Bordeaux, copper sulphate solution and Arsenites.	<i>Just before blossoms open, Bordeaux. For bud moth, Arsenites when leaf buds open.</i>	<i>When blossoms have fallen, Bordeaux and Arsenites.</i>	10-14 days later, Bordeaux and Arsenites.	10-14 days later, Bordeaux and Arsenites.	10-14 days later Bordeaux and Arsenites.
CABBAGE, CAULIFLOWER (Worms, aphids.)	When worms or aphids are first seen, Kerosene Emulsion.	7-10 days later, if not heading, renew emulsion.	7-10 days later, if heading, hot water 130 F. or Hellebore.	Repeat third in 10-14 days if necessary.		
CELERY..... (Leaf blight, rust.)	Ammoniacal copper carbonate at first appearance of disease.	Repeat first to keep foliage protected.				
CHERRY..... (Rot, aphids, slug.)	As buds are breaking, Bordeaux. When aphids appear, Kerosene Emulsion.	When fruit has set, Bordeaux. If slugs appear, Hellebore.	10-14 days if rot appears, Ammoniacal copper carbonate.	10-14 days later, Ammoniacal copper carbonate.		
CURRANT..... (Mildew, worms.)	At first sign of worms, Arsenites and Bordeaux.	10 days later, Hellebore. If leaves mildew, Bordeaux.	If worms persist, Hellebore.	After fruit is harvested, apply Bordeaux freely.		
GOOSEBERRY..... (Mildew, worms.)	When leaves expand Bordeaux. And for worms as above.	10-14 days later, Bordeaux. For worms as above.	10-14 days later, Ammoniacal copper carbonate. For worms as above.	10-14 days later, repeat third.		
GRAPE..... (Fungus diseases, flea beetle.)	In spring when buds swell, copper sulphate solution. Paris Green for flea beetle.	When leaves are 1-7½ inches in diameter, Bordeaux, Paris Green for larvæ of flea beetle.	When flowers have fallen Bordeaux, Paris Green as before.	10-14 days later, Bordeaux.	10-14 days later, if any disease appears, Bordeaux.	10-14 days Ammoniacal copper carbonate. Make later applications of this if necessary.
NURSERY STOCK..... (Fungus diseases.)	When first leaves appear, Bordeaux.	10-14 days, repeat first.	10-14 days, repeat first.	10-14 days, repeat first.	10-14 days repeat first.	10-14 days, repeat first.
PEACH, NECTARINE, APRICOT..... (Brown rot.)	Before buds swell, copper sulphate solution.	Before flowers open Bordeaux.	When fruit has set, repeat first.	10-14 days later, repeat.	When fruit is nearly grown, Ammoniacal copper carbonate.	Repeat five at intervals of 5-7 days if necessary.

**BEAN**—**Anthracnose, Pot-rust**—1st. Bordeaux, when first true leaf has expanded. 2nd, 3rd, etc., the same at short intervals, to keep the foliage covered by the mixture.

**BEET**—**Leaf Spot**—When four or five leaves have expanded Bordeaux. Repeat same every 10-14 days.

**CARNATION**—**Anthracnose, rust, spot**—At first appearance of disease, Bordeaux applied in *fine* spray. 2nd, 3rd, etc., if plants are not blooming. Bordeaux; ammoniacal copper carbonate to avoid staining the flowers. Keep foliage covered with a fungicide. *Red Spider*—Syringe freely with clear water; kerosene emulsion.

PEAR..... (Leaf blight, scab, psylla, codling moth.)	As buds are swelling, copper sulphate solution or Bordeaux.	Just before blossoms open, Bordeaux, Kerosene emulsion when l'ues open for psylla.	After blossoms have fallen Bordeaux and Arsenites, Kerosene emulsion if necessary.	10-12 days later, repeat third.	10-14 days later Bordeaux, Kerosene emulsion applied forcibly for psylla.	10-14 days later, repeat fifth if necessary.
PLUM..... (Fungus diseases, curculio.)	During first warm days of early spring Bordeaux for black knot and other fungus diseases. During mid-winter, Kerosene emulsion or plum scale.	When buds are swelling Bordeaux for black knot and other fungus diseases. During mid-winter, Kerosene emulsion for plum scale.	When blossoms have fallen, Bordeaux. Begin to jar trees for curculio before buds start in spring. Kerosene emulsion for plum scale.	10-14 days later, Bordeaux. Jar trees for curculio every 2-4 days. For San Jose Scale, Kerosene emulsion when young appear in spring and summer.	10-20 days later, Bordeaux for black knot. Jar trees for curculio. When young plum scale insects first appear in summer, Kerosene emulsion.	10-20 days later, Bordeaux for black knot. Later applications may be necessary to prevent leaf spot and fruit rot, use Ammoniacal copper carbonate.
POTATO..... (Scab, blight, beetles.)	Soak seed for scab in corrosive sublimate solution (2 oz. to 16 gals. of water) for 90 minutes.	When beetles first appear, Arsenites.	When vines are two-thirds grown, Bordeaux, Arsenites for beetles if necessary.	10-15 days later, repeat third.	10-15 days later Bordeaux if necessary.	
QUINCE..... (Leaf and fruit spot.)	When blossom buds appear, Bordeaux.	When fruit has set, Bordeaux and Arsen.	10-20 days later Bordeaux.	10-20 days later, Bordeaux.		
RASPBERRY } BLACKBERRY } DEWBERRY } (Anthracnose, rust.)	Before buds break, copper sulphate solution Bordeaux. Cut out badly diseased canes.	During summer, if rust appears on the leaves, Bordeaux.	Repeat second if necessary.	Orange or red rust is treated best by destroying entirely the affected plants.		Kerosene emulsion must be used very dilute, as rose foliage is easily injured by it.
ROSE..... (Mildew, black spot, red spider, aphids.)	For mildew. Keep heating pipes painted with equal parts of lime and sulphur mixed with water to form a thin paste.	For black spot, spray plants once a week with Ammoniacal copper carbonate using fine spray.	For red spider, spray plants twice a week with Kerosene emulsion. Apply to underside of foliage.	For aphids, spray affected parts with Kerosene emulsion when necessary.		
STRAWBERRY..... (Rust.)	When growth begins in spring, Bordeaux.	As first fruits are setting, Bordeaux.	As first fruits are ripening, Ammoniacal copper carbonate.	When last fruits are harvested, Bordeaux.	Repeat third if foliage rusts.	Repeat third if necessary.
TOMATO..... (Rot, blight.)	As soon as disease is discovered, Bordeaux or a clear fungicide.	Repeat first at intervals 7-10 days.				

# CATALOGUE

SPRAMOTOR PAINTING, WHITEWASHING AND  
SPRAYING MACHINES.

## POINTS OF EXCELLENCE.

The excellence of the Spramotor consists in the perfectness of its detail. No spraying apparatus made anywhere in the world is its equal in this respect. We illustrate some of these parts and ask for comparison. There is three times more weight of brass in the Spramotor than any other of equal capacity and price.

## SPRAMOTOR VALVES.

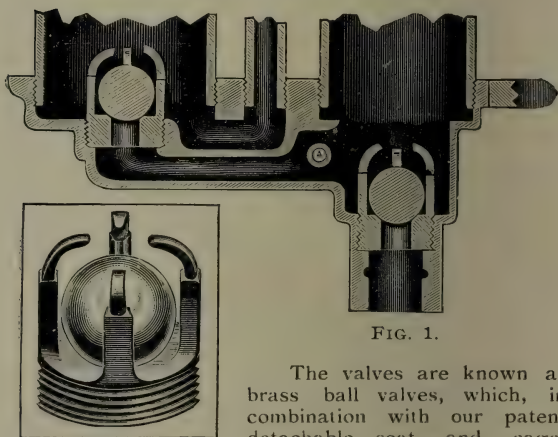


FIG. 1.

The valves are known as brass ball valves, which, in combination with our patent detachable seat and cage, make the only effective and durable appliance, and we warrant them for the use of any mixture, even to thick lime whitewash applied while hot. These valve seats being detachable, can be renewed at any time at a trifling cost and are made this way as an extra precaution and as a special feature; for should the valve seat (which is the most delicate part of the outfit) become untight or faulty from any cause it can be renewed at a few cents cost, and without expensive charge for express, as it can pass through the Post Office. This will be appreciated by experienced operators.

In starting operations, the plunger rod is disconnected and the handle actuated, thereby operating the agitator to thoroughly mix the contents of the vessel containing the mixture to be used. The plunger rod is then connected with the handle. The continuous action of the latter now operates the plunger as well as the agitator, which receives double the length of stroke of the plunger. The mixture

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UNION STORAGE COMPANY.

SECOND AND LIBERTY AVES.,

Pittsburg, Pa., July 23rd, 1900.

The Spramotor Co., London, Ont.

Gentlemen,—We are glad to say the machine works satisfactorily. We will be glad to have your man call and see us, although it is not necessary for him to do so, for the purpose of giving information about the Spramotor.

Yours truly,

UNION STORAGE CO.,

S. Bailey, Jr., President.

within the vessel is drawn up into the plunger tube at every stroke through the valve.

The down stroke of the plunger forces the mixture through the passage way, through the upper valve and out through the discharge pipes, the lower and upper valves alternately opening and closing as necessary.

When desired, kerosene oil may be introduced between the valves, as shown at "A," when it mingles with the fluid drawn through the suction tube and is expelled with it in a fine spray, avoiding the necessity of emulsifying the oil for use as is now commonly done.

These valves are continually being ground to the seat, and the construction is such as to give the balls a spinning motion at each opening and closing, thereby insuring their remaining perfectly round and tight in use.

### SPRAMOTOR STRAINER.

This cut accurately illustrates the Spramotor Strainer, which is secured to the bottom of the suction of all Spramotors and Spramotor Jrs., which insures the proper straining of all mixtures

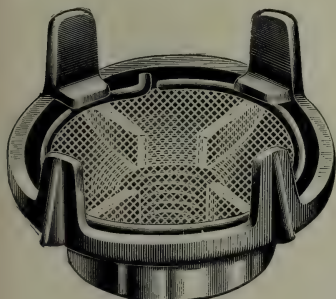


FIG. 2.

entering the motor, thereby preventing the nozzles becoming stopped. The strainer is of novel construction, the wire gauze supported by ribs which prevent the gauze being sucked inwardly when its apertures are closed by a leaf or other obstruction. In order to retain the gauze in position, there is formed upon the strainer the projecting

lugs under which is inserted a brass wire ring, as shown. If it is desired to renew the gauze at any time, or remove it, the wire is readily sprung from under the lugs, and is as readily replaced to hold the gauze in place when desired.

### SPRAMOTOR AGITATOR.

One of the most important features of a spraying apparatus is the Agitator or mixer. To get satisfactory results in spraying or painting the chemicals or paints must be thoroughly well mixed before commencing to apply them. It is also of the greatest importance in spraying to have the barrel full of mixture of uniform strength.

The agitator must, therefore, act independently of the motor, as well as automatically with it. By means of a simple device this is accomplished in the simplest possible way, being in the form of a dasher and sleeved around the suction and actuated from the handle, the agitator is under perfect control of the operator; therefore, by withdrawing the center pin connecting the plunger, the motor will be at

---

Owen Sound, Oct. 6th, 1899.

Spramotor Co., London, Ont.

Dear Sirs,—Your communication of 27th ult. to hand and contents noted. Mr. McKay handed me the letter. I had the buildings and fences whitewashed with the machine purchased from you, and I must say that the way the machine did the work was entirely satisfactory, and a great saving in both time and money. I consider it a very good investment and would not be without one or more.

Yours, etc.,

JOHN RAMSAY,

Manager Owen Sound Fair.



rest while the operation of agitating the mixture is performed. The insertion of the plunger pin, which may be done instantly, permits the agitator and motor to be operated together.

This improvement, which is only possible with the Spramotor, is invaluable, as it effectually prevents damage being done by spraying with the solutions too strong at the commencement, or the nozzles becoming clogged.

A pressure to spraying of 75 lbs. per square inch is about right for spraying purposes, and as the pressure of 250 pounds can easily be developed with the Spramotor, we see the extent of the reserve. Pumps designed for extreme pressure are necessarily of small cylinder, and therefore of limited capacity, usually of extreme length of handle and very short stroke, which involves such a quick, jerky action which will be very trying to the operator if long continued. Any man who has sprayed all day will appreciate this. In the Spramotor the objections have been removed, and the only directions are cast on the handle, "long full stroke."

### SPRAMOTOR AUTOMATIC PLUNGER.

This sectional view of the Spramotor Plunger will clearly show to a practical man the genuineness of the claims.

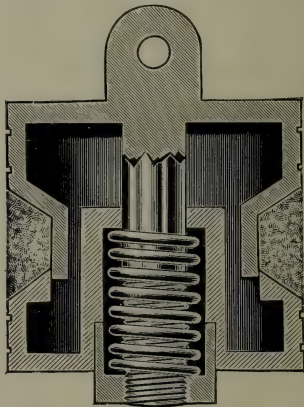


FIG. 3.

The plunger being in two parts and so formed that the coil spring continually presses the parts together when newly packed, preferably with cotton packing (it being the only material thus far tested that will withstand the action of hot lime), the spring is removed and the nut screwed up to its place and the plunger opened to its full extent. After the groove is full of packing the spring is placed in position and the plunger put into its place in the tube and a few strokes of the handle will assist the spring and make it tight.

The plunger consists of two parts, sleeved together and so shaped as to form between them a recess triangular in cross section. Into the recess in the centre of the upper part extends the sleeve formed on the lower part of plunger. Formed on the upper part of the plunger and extending through the sleeve is a spindle. The sleeve has two shoulders formed thereon. Screwed upon the end of the spindle is a nut of such size that it will not pass the shoulder in the lower part of the plunger. Between the nut and the shoulder is placed a coil spring, which tends to maintain the two parts of the plunger together.

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THE JAMES CUNNINGHAM, SON & COMPANY,  
CARRIAGE AND HEARSE BUILDERS.

Rochester, N.Y., Nov. 20th, 1900.

Spramotor Co., London, Ont.

Gentlemen,—We have used one of your Spramotors for whitewashing the interior of our blacksmith shop, and other parts of our factory, with a great deal of satisfaction. It has done all that your Company claimed it would do, and we find it to be a great saving of time and money.

Very truly yours,

THE JAMES CUNNINGHAM, SON & CO.

When the plunger is in use the recess is full of a suitable packing, and as the parts of the plunger are normally somewhat separated, the tension of the coil spring tending to draw the parts of the plunger together, causes the bevelled sides of the recess to force the packing outwardly against the inside of the plunger tube, thus insuring a close fit.

When the plunger is forced downward the pressure of the fluid upon its lower parts tends to increase the spreading action upon the packing, whereas when the plunger is raised this pressure is removed and the plunger can be raised without unnecessary friction.

The inventor's aim was to devise a plunger that could be cheaply made, durable when using cement covering or whitewash, that could be easily and cheaply repacked with some cheap material, capable of withstanding the action of the acids and sandy mixtures, one that would adjust itself to the wear and tear of hard usage, as well as with the least possible friction, and remain tight at any pressure.

The idea of metal or hard packing, of whatever nature, could not be employed, owing to the fact that the grit in the cement or whitewash was found to cut not only the packing but the grooves in which the packing was placed, as well as the tubing against which the hard or spring packing pressed. Another reason was the impossibility of keeping the plunger when so packed tight, as many as 10 strokes per minute being lost from this cause alone to maintain 100 pounds pressure, and it also was discovered that unless a quick movement was maintained the ring packing was useless, even when new, owing to the enormous loss through leakage, although pumping clear water. It was too expensive to repair, and could not be done without recourse to the factory.

The word "automatic" to the average person suggests complication, but one has only to see this latest development of an automatic compensating plunger to realize its extreme simplicity.

The spring has been found to release enough on the up-stroke to avoid friction, while on the down-stroke the pressure of the liquid will assist the spring to make it tight. The conformation of the grooves also transfer the friction on down-stroke entirely off the plunger to the packing which takes all the wear and tear.

The problems presented were faced and each step was carefully tested, and when finally the last step was taken the inventor had arrived at what the most eminent engineers and mechanics pronounce perfection.

- 
1. It is practically indestructible.
  2. It is automatic in adjusting itself to varying pressure.
  3. It is frictionless.
  4. It is compensating.
  5. Can be repacked without the aid of tools in two minutes, at a cost of  $\frac{1}{2}c$ .
  6. It is absolutely tight under any pressure.
  7. It prevents cutting of the tubing and of itself.
  8. It is as nearly perfection as human ingenuity has yet devised.
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**THE SPRAMOTOR TREATISE** is like the Spramotor itself, "it can be relied upon."

WHEN SUCH MEN AS THESE WRITE AS THEY DO, IT SHOULD PROVE TO YOU THAT IT IS THE RIGHT THING TO HAVE.

"I find your 5th Annual Catalogue a veritable treatise on treatment of insect and fungus diseases. The remedies have been well selected from the best sources, and are thoroughly reliable.

Yours, etc.,

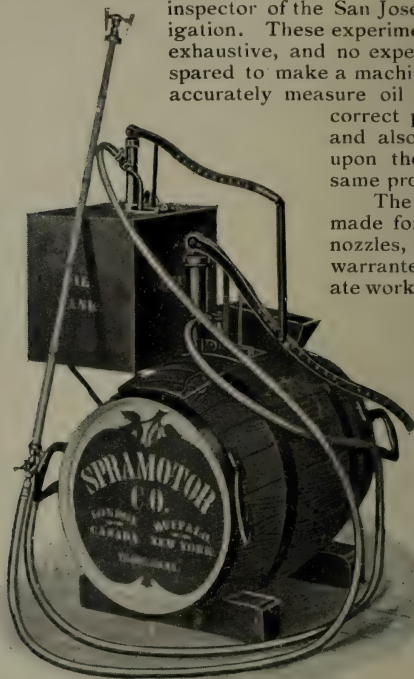
W. LOCHEAD, B.A., M.S.

*"Are you with us, or shall we on and not count on you."*

## Mechanical Mixtures of Kerosene and Crude Petroleum.

Patented in Canada United States, Belgium, New Zealand, Australia.

This illustration will show the results of a long series of experiments on the part of the SPRAMOTOR CO., aided by the experience of Mr. Geo. E. Fisher, the chief inspector of the San Jose Scale investigation. These experiments have been exhaustive, and no expense has been spared to make a machine that would accurately measure oil and water in correct proportions, and also to deliver it upon the tree in the same proportion.



The machines are made for one to eight nozzles, and are fully warranted to do accurate work, and as the oil and water are separate until they mix at the nozzle, the trouble experienced with all other machines of single conducts is obviated.

The oil tank will be provided with a hot water jacket for winter spraying, when

FIG. 21, PATENTED.

so ordered, at an advanced price. This is valuable to keep the crude oil at the right temperature to flow in very cold weather.

Any two Spramotors can be arranged to make a combination Oil and Water Spramotor, and special appliances will be supplied by the Spramotor Co. to those already using a Spramotor, and is economical for large operators.

All of our combination machines are provided with double lines of hose, with double patent hand valves, and patent bamboo (or iron) extension pipes, as may be ordered, having double pipes, the one within the other with drip guard, mixing chamber with diaphragm. Bor-

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Quebec, P. Q., August 3rd, 1899.

The Spramotor Co., London, Ont.

Sirs,—I have yours of 1st inst., and in answer I have much pleasure to inform you that the outfit bought from your Co. for the purpose of whitewashing and disinfecting is giving us the greatest satisfaction. It is cheap, easily worked and in some instances, as whitewashing the inside of stables, does the work of twenty men. I am sure that all those who try it will appreciate it as I do. Wishing all the success you deserve, I am,

Yours very truly,

J. A. COUTUNE, Inspector.

deaux or any mixture may be used as well as the combined oil and water mixture.

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## **Spramotor Combination Outfits.**

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### **OUTFIT A-O/O.**

Price for two No. o Spramotors in combination, with 10 ft. double lines of hose ; two patent hand valves ; double combination ; extension pipe with mixing chamber ; diaphragm and drip guard with 50-gallon water barrel and galvanized oil tank ; complete as shown, with one nozzle..... **\$29.00**  
Extra for two nozzles, cluster ..... **1.00**  
Less, if double iron extension pipe instead of bamboo..... **1.00**  
Extra hose 12c. per foot net.

---

### **OUTFIT B-1/O.**

Price of No. 1 Water Motor and No. o Oil Spramotor in combination, as described in Outfit A, with two nozzels..... **\$35.00**  
Less if iron extension pipe is used..... **1.00**  
Extra for double lines of hose, &c., for three operators and two nozzles..... **10.50**

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### **OUTFIT C-1/1.**

Being No. 1 Water and No. 1 Oil Spramotor in combination, as described in Outfit A, for two operators, two nozzles ..... **\$39.50**  
Extra for extra line of hose and double accessories **10.50**  
Less if with iron extension pipes, each..... **1.00**

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### **OUTFIT D-2/O.**

Being No. 2 Spramotor and No. o Spramotor in combination, complete, with two lines of hose, patent hand valves, two bamboos, four nozzles, (two on each line) for three operators..... **\$49.50**  
Less if iron extension pipes instead of bamboo.. **2.00**

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### **OUTFIT E-2/1.**

Being Spramotor No. 2 and No. 1 in combination, with casks and oil tanks, two lines of double hose, four hand valves, two double extension pipes, and two two-nozzle clusters, complete..... **\$53.00**  
Same if with four double lines of hose, eight hand valves, four bamboo double extension pipes, and four nozzles..... **74.00**  
Less if iron extension pipes are used, each \$1.00.  
Less if stop cocks instead of hand valves, each 25c.

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Manor, Pa., July 22nd, 1899.

Spramotor Co., King St., London, Ont.

Gentlemen,—We take pleasure in stating that the Spramotor Jr. Outfit shipped to us some time ago, has proved very satisfactory, and up to our requirements in every respect, in fact, is the best machine of the kind we have ever seen.

Please ship us at your earliest possible convenience, Spramotor Outfit No. 1-D complete, less the bamboo extension rod, and give us the lance described in your catalogue.

Very truly yours,

MANORFIELD STOCK FARM CO.,  
Per M. S. F



## The Spramotor Combination Knapsack

**FOR MIXING AND SPRAYING MECHANICAL  
MIXTURES OF OIL AND WATER.**

(See description on page 57.)

It can be used for all classes of spraying with one operator, is made with all brass Spramotor, with copper or galvanized tank, as desired, with or without the oil mixing attachment.

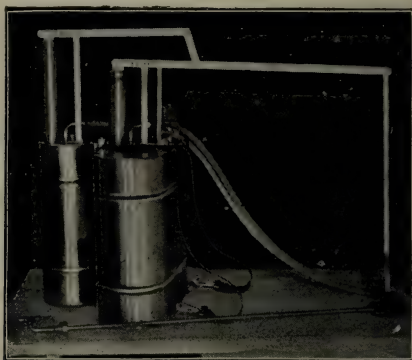


FIG. 20. PATENTED.

This cut accurately shows the Spramotor Combination Knapsack, built with tanks of the finest cold rolled copper with apron to prevent splashing, leather straps, right and left hand action without detaching anything (simply turning it over from one side to the other when one arm is tired). The very acme of excellence in mechanical construction, strictly high grade throughout. Automatic plunger, automatic mechanical agitator, strainer, detachable bronze ball valves, double hose 3 feet long, double shut-off valves, double brass extension pipes, and mixing chamber and drip guard with nozzle ... **\$24.00**  
Same, if with galvanized tanks..... **20.00**

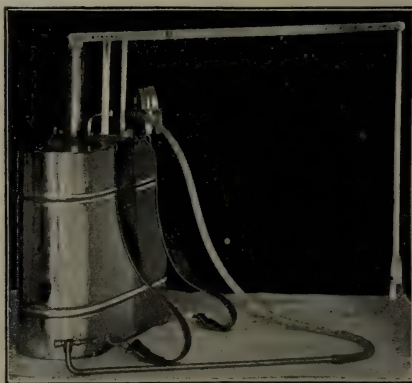


FIG. 20½. PATENTED.

This cut shows the Spramotor Knapsack with the oil tank detached, arranged with one line of hose, patent

hand valve, and brass extension pipe, drip guard and nozzle, as described above.

Price, complete with copper tank.....\$15.00  
Same, with galvanized tank .... . 12.00

These machines are unlike any other knapsack before offered to the public, and are warranted to be better value for the money invested than is obtainable elsewhere.

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## How to Apply Mechanical Mixtures.

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One part of oil mechanically mixed with nineteen parts of water (a 5% mixture), when sprayed upon the tree will give a very thin coat of oil when the water dries up, which will be in a few minutes, leaving only pure oil.

When one part of oil is mechanically mixed with 9 parts of water (a 10% mixture) and sprayed upon the trees, the coat will be twice as thick as when 5% is sprayed. Still it is pure oil when the water has evaporated.

When one part of oil is mechanically mixed with 3 parts of water (a 25% mixture) it is 5 times as much oil as when 5% of oil is used, and the coat is five times thicker.

This should be remembered in the application of all mechanical mixtures, if the 5% mixture is sprayed upon the trees to cover it carefully, the result will be a thin coat, as stated, but if the tree is covered the second time, either by spraying too long, or passing over the surface the second time, as many do to make sure, the coat will be twice as thick as should be, and the result will be 10% or perhaps more.

If the intention is to apply 25% of oil, and 75% of water mixture, and the operation is continued too long, or covered the second time, the result may injure the tree. Therefore, too much care cannot be used, first to understand just the quantity required to properly combat the insect or scale, then apply it properly to cover all the scales with the mixture, but not more.

Remember that the water is only useful in making it possible to apply a thin coat, that it dries up shortly leaving the oil to do the remedial work. Do not allow the nozzle to play upon the tree longer than necessary to properly cover the surface.

The higher the pressure, the finer the nozzles, the better the work.

The illustration following, reproduced from a photo of 25 bottles, two of each percentage taken at haphazard with crude petroleum at our factory, by Mr. Geo. E. Fisher, shows the result of the test.



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**KIND WORDS CAN NEVER DIE**—Read carefully the testimonials, you will see that not only the perfect working of the Spramotor is highly spoken of, but its superior construction is acknowledged.

# Painting and Whitewashing Machine

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This illustration shows a type of Spramotor that has been sent all over the world for the application of oil and

water paints. It is intended to be used wherever the ground or floors are hard. The wheels are strong, and are fitted with our strong swivel castor. It is very convenient in handling; will pass through any opening the width of the cask. The Spramotor will be fitted lengthwise of the cask if desired; can be turned within its own length;

can be handled by one person, and has all the latest improvements.

Complete directions for operating and formulæ for mixing and applying the paint and whitewash are supplied with the apparatus. It is fully warranted, and will do better work than can be done

FIG. 4,  
PATENTED.



with brushes, and twenty times faster. See testimonials from prominent users.

Price, as illustrated, with Spramotor, ten feet hose, patent hand valve, 8-foot iron extension rod, drip guard and painting nozzle, barrel and screen, complete, as follows :

With No. 1 Spramotor as described on page 63.	\$22.00
If with double lines of hose and accessories . . . . .	28.00
If with brass agitator extra . . . . .	1.00
No. 2 Spramotor and single line of hose . . . . .	27.00
Extra for brass agitator. . . . .	1.00
Extra for all brass Spramotor. . . . .	3.00
No. 2 Spramotor and double lines of hose and accessories . . . . .	32.00

Extra hose at 12c. per foot.

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## AWARDS.

Gold Medal at Pan-American Exhibition, 1901.  
First Place at the Government Spraying Contest, at Grimsby.  
Diploma at Industrial Exhibition, Toronto.  
Silver Medal at Industrial Exhibition, Toronto.  
Gold Medal at Western Fair, London.  
Silver Medal at Western Fair.  
Bronze Medal at Western Fair, London.  
Diploma at Western Fair, London  
Diploma at Ottawa, 1898.

*"If you cannot find markets make them."*

---

These machines will apply any kind of cold water or oil paint, and for whitewashing the interior of factories are unexcelled. The testimonials from large manufacturing concerns in Canada and the U. S. will show what the users think of it.

The day of the brush for whitewashing and cement coverings of all buildings, internally and externally, is at an end, for the Spramotor has proven beyond a doubt that all kinds of work of this character can be done at a much lower price and so much better, that the users of old style methods will in a very short time be like Othello—"their occupation gone."

The Spramotor is the only device that can use hot lime and any kind of water and oil paints, and by its use one man and boy (to do the pumping) could do whitewashing better and faster than twenty men could do the same quantity of work with brushes in the old style way. Illustration below, reproduced from a photo, will clearly show how it is done.



THIS PHOTO ILLUSTRATES THE SPRAMOTOR (FIG. 4) AT WORK ON A BARN WITH TWO NOZZLES IN THE ONE LINE OF HOSE. SEND FOR BOOKLET ABOUT PAINTING, WILL BE READY 1ST MAY, 1902. IT'S FREE.

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## AWARDS.

Diploma at Simcoe.

Diploma at Ridgetown.

Diploma at Blyth.

Diploma at Essex.

Diploma at Seaforth.

Diploma at Aylmer.

Diploma at Goderich.

Diploma at Watford.

Diploma at Ottawa, 1899.

Diploma at S. A. Comte Chateaugay.

Diploma at Trois-Rivieres, 1899.

Diploma at Exposition Regionale.



## Spramotor Jr. No. 0 Painting Machine.

W. H. Heard's Patent { Canada 1895, 1898, 1901.  
U. S. 1900, 1901, 1902.

This illustration shows accurately our one-nozzle painting, spraying, whitewashing and disinfecting apparatus. It is built on the interchangeable plan and to fill the demand for a high-grade, up-to-date, durable appliance that could be sold at a moderate price. It is

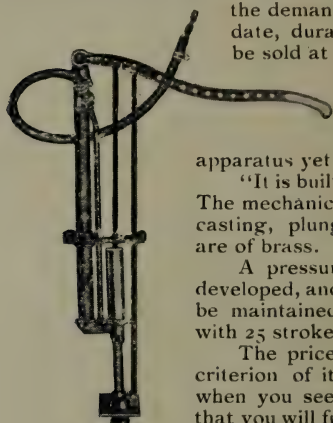


FIG. 5.

the result of exhaustive trial and experiment, and is now offered as the best one-nozzled

apparatus yet designed.

"It is built as carefully as a watch."

The mechanical agitator, strainer, base casting, plunger tube and couplings are of brass.

A pressure of 500 pounds can be developed, and a pressure of 100 pounds be maintained with one nozzle open, with 25 strokes to the minute.

The price at which it is sold is no criterion of its value, and it is only when you see the internal mechanism that you will fully realize its excellence. It will displace all others as soon as users become acquainted with its merits.

It will be found the best appliance for painting your barns or fences and rough surfaces, whitewashing and disinfecting your poultry houses or cellars and spraying all kinds of fruit trees.

Even should you be possessed of a large spraying apparatus, there are many odd jobs that a barrel outfit will be found too large and too cumbersome to take around to the various buildings and through small openings.

Complete formulæ and directions will be supplied to all purchasers. Can be operated by one person.

Price complete, with 2½ feet 3-ply hose and Spramotor, painting and spraying nozzle.....\$7 25  
Five gallon heavy galvanized can, extra..... 2.00

## Spramotor Jr. No. 0 Outfits.

For the convenience of our customers in ordering, we herewith give a complete list of Outfits, covering a range of accessories that will be found to fill the needs for almost all classes of work.

### OUTFIT A.

Iron lance, 1 to 3 feet long.....	\$0.25
Spramotor patent hand valve.....	1.00
Spramotor No. 0, 2½ feet hose and nozzle.....	7.25
	<hr/> \$8.50

Picton, Ont., August 24th, 1896.

Spramotor Co., London, Ont.:

Dear Sirs, - Spraying potatoes is a success again this year. Sample rows left unsprayed were dead with blight by Aug. 15th, while the next rows are beatifully green yet. The No. 2 and attachments does satisfactory work in field and garden,  
I remain, yours truly, ALF. BROWN.

### OUTFIT B.

Same with galvanized can.....	\$10.50
“ Brass lance.....	10.75

### OUTFIT C.

Being Spramotor Jr. No. O, 2½ feet hose, patent hand valve, bamboo extension rod and nozzle.

Price, without can .....\$10.75

### OUTFIT D.

Being Spramotor Jr. No. O, 2½ feet hose and nozzle, with can (as shown).

Price.....\$9.25

### OUTFIT E.

Being Spramotor Jr. No. O with can, 2½ feet hose, patent hand valve and lance. Just right for spraying small fruit, white-washing or painting or disinfecting work.

Price.....\$10.50

Extra hose, 10c per foot.

### OUTFIT F.

This outfit is complete in every respect, and with it any kind of work can be done that can be accomplished with one nozzle. When attached to our patent five gallon can, it is a most portable device, can be carried around by one hand, or by means of the handles provided. The can has a raised bottom and heavy flanged rim, on which the can rests. Our patent catches allow the lid to be instantly removed, as shown in outfit D. It effectually prevents any splashing, and a lady can use the apparatus at any class of work or any kind of mixture and not soil her dress.

Price ..... \$12.75

### OUTFIT G.

One Spramotor No. O, with 10 feet of hose, hand valve, and 8 foot Iron Extension Pipe, Patent Drip Guard and one Spramotor Nozzle, complete ready to attach to half barrel.....\$10.00

Suitable for spraying trees, and will be satisfactory for small places of 25 trees ; works perfectly with one nozzle.

### Whitewashing and Painting Outfits

will be made up to suit the requirements of purchasers. We advise for factories that the barrel or half barrel be placed on wheels, for in this way they are very convenient for use and can be run as a truck from one place to another, and through any door or hoist that will admit the size of the barrel.



FIG. 7.

Montreal, January 11th, 1899.

Spramotor Co., London, Ont.:

Gentlemen :—Your apparatus for whitewashing answers admirably; does the work much better than can be done with brushes and at a great saving of time.

Yours truly,

The Canada Sugar Refy. Co Limited.

G. A. DRUMMOND.



## Spramotor Jr. No. 0 Wheel Outfit.

The above cut illustrates a novel wheel outfit, which is a half-barrel with screen, neatly painted and fitted to strong iron wheels with tires  $1\frac{1}{4}$  in. wide, as shown, on which we fit Spramotor Jr. No. 0 with 5 feet of  $\frac{1}{2}$  in. hose, patent hand valve and iron extension rod and nozzle.

Price complete, (one nozz'e) . . . . . \$19 35

Price complete, with bamboo extension rod..... 20.95

Extra hose 12c. per foot.

This outfit will be found the most serviceable arrangement for garden or gentlemen's city suburban residences. It will do with one nozzle any work possible with our larger outfits. (See description of Spramotor Jr. on page 60.)

---

Grenville, Que., June 20, 1898.

Spramotor Co., London, Ont.:

Dear Sirs,—Enclosed please find Post Office Order for nine dollars and thirty cents, amount of balance on spray pump bought of you this spring. The pump is all I could wish, and I heartily recommend it.

Yours truly,

ROBT. HAMILTON.

## Spramotor Jr. No. 1.

This cut illustrates Spramotor Jr. No. 1. The description on page 60 will apply, and all considered, is the best value of any of the Spramotor machinery. It is a great improvement on the old style machine. Is greatly increased in capacity, the air chamber may be ordered in brass, at a slight additional cost.

It has three lengths of stroke, 3-in., 4-in. and 5-in., thereby accommodating itself to the number of nozzles used, the agitator doing its full work at any stroke. The Agitator, Strainer, Suction Tube, and Brass Ball Valves, are the same as on the No. 2. The plunger can be removed instantly for repacking. It is adjustable to any size barrel, by means of the clamping plates. All parts are interchangeable, and it has screw threaded joints, and is the best machine for 400 trees or less.



FIG. 9.

By means of our patented device, two of these machines may be coupled together and used as an oil emulsion pump for crude oil or kerosene in any proportion. (See description on page 54.)

All the patented improvements contained in our Spramotor are embodied in this machine, and it has all the working parts of brass, or entirely of brass, as may be desired. Read the testimonials and realize what this means to you. It will paint in oil or water colors, use whitewash or cement covering, and is plenty large enough for spraying 500 trees or less. It is built on the interchangeable plan. The suction tube and agitator are supplied in iron unless otherwise ordered.

This size Spramotor is designed especially for painting with water and oil paints, as well as the spraying of fruit trees. It represents the best value of any machine we make.

Three lengths of stroke, 3 ins., 4 ins. and 5 ins., thereby accommodating itself to the number of nozzles in use, the mechanical dash agitator doing its full work at every stroke. It is provided with automatic, compensating plunger, Fig. 3, patent strainer, Fig. 2, and detachable bronze metal ball valves.

The agitator, strainer, suction-tube and valves are interchangeable, same size as our No. 2 size. The plunger may be removed and repacked instantly, if desired. It is adjustable to any size barrel. All parts interchangeable.

Plunger tube of No. 14 gauge seamless brass, 2 ins. in diameter. All plungers are warranted perfectly tight, and kept so automatically, the operator is not required to do anything, no packing glands or screw compression or metallic rings, which cannot, with the most expert care, be

W. H. Heard, Esq.:

Ottawa, Feb. 1st, 1899.

Dear Sir,—I used your Spramotor in my apple orchard of 1,600 or 1,800 trees at Grand Pre, in the far-famed Annapolis Valley, Nova Scotia, during the season of 1898. My orchardist reported to me that it was the most serviceable apparatus he had ever tried. It is easy to handle and perfect in action. I never had my orchard looking cleaner than at the end of last season.

Yours truly,

GEORGE JOHNSON.



kept right, which is one of the reasons why no machine but the Spramotor will measure oil and water.

Price, Spramotor only, steel air chamber and iron agitator.....\$10.00

Price, Spramotor only, all brass except plates and handle..... 13 00

The above prices does not include accessories.

## **Spramotor Outfit 1=A.**

**For Low Spraying, One Line Hose.**

One Spramotor Jr. NO. 1 (as described above) arranged with one line of  $\frac{1}{2}$  inch hose 10 feet long, with couplings attached, one Spramotor nozzle.

Price complete, without barrel..... \$12.00

Same, with 2 lines hose, each 10 feet, and 2 nozzles 14.50

Extra, if all brass except handle and plates..... 3.00

## **Spramotor Outfit 1=B.**

**For Low Spraying, One Line Hose.**

One Spramotor Jr. No. 1 (as described above) with one line of  $\frac{1}{2}$  inch hose 10 feet long, with couplings attached, one Spramotor lance 13 inches long, and one Spramotor nozzle, without barrel.

Price..... \$12.50

Same with 2 lines hose, 2 lances and 2 nozzles 15.00

Extra, if all brass except handle and plates..... 3.00

## **Spramotor Outfit 1=C.**

One Spramotor Jr. No. 1 (as described above) with one line of  $\frac{1}{2}$  inch hose 10 feet long, with couplings attached, nozzle, bamboo extension rod with seamless brass inner tube, brass cupped ends and patent drip guard, one patent hand valve and one Spramotor nozzle.

Price complete, without barrel ...\$15.50

Same with 2 lines hose, each 10 feet long, with couplings attached, two stop cocks, two bamboo extension rods, two nozzles.....\$21.00

Extra, if all brass except handle and plates ..... 3.00

Just the outfit for kerosene emulsion work.

## **Spramotor Jr. Outfit 1=D.**

**For High Spraying, 1 Line Hose**

This outfit is the same as 1-F, but has brass-lined bamboo extension rod with drip guard instead of iron.

Price complete, (without barrel) .....\$17.00

Same with three-nozzle cluster..... 18.10

Extra, if all brass except handle and plates..... 3.00

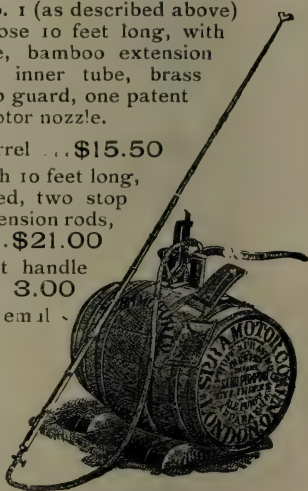


FIG. 11.

Fruitland, 4th Feb., 1896.  
W. H. Heard, Esq., Spramotor Co., London:

Dear Sir,—I am pleased to be able to inform you that the fifteen Spramotors you furnished for the experimental spraying of fruit trees conducted by the Department of Agriculture of Ontario for 1896. gave entire satisfaction.

Yours truly,

W. M. ORR, Supt.

## Spramotor Jr. Outfit 1=E.

For High Spraying, One Line Hose.

Same as 1-F, with one nozzle instead of two.

Price complete, without barrel.....\$14.00

Same with two lines hose, two hand-valves, two extension rods, two Spramotor or Spramotor Vermorel nozzles and two drip guards..... 18.00

Extra, if all brass except handle and plates..... 3.00

## Spramotor Jr. Outfit 1=F.

For High Spraying, One Line Hose.

This is our model outfit No. 1, for apple spraying, and will be found to meet all the requirements where only one

line of hose is required. With the addition of the Y connection and two or three nozzles we provide an effective means by which one man can do the work of two under old conditions. This is a strictly high-class outfit, and will repay the cost of

the entire outfit in one season by the saving of labor.

One Spramotor Jr. No. 1, (as described on page 63), including one line of  $\frac{1}{2}$  inch hose 10 feet long, couplings attached, one patent hand valve, one 8 foot extension rod, drip guard, two Spramotor nozzles, one brass Y connection.

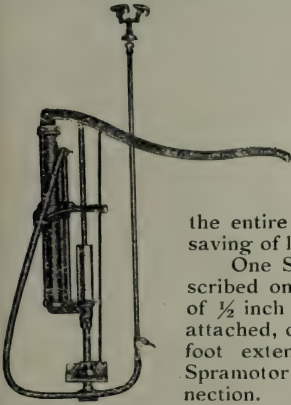


FIG. 12.

Price complete, without barrel \$15.50

Same with three-nozzle cluster..... 16.60

Extra, if all brass except handle and plates .... 3.00



London, Ont. Aug. 12th, 1897.

The Spramotor Co. City:

Dear Sirs.—We have pleasure in recommending the Spramotor painting apparatus, having used it to whiten the interior of our mill and stables and find it efficient and economical, and consider it a first class machine.

Yours truly,

W. PLEWES.

## Spramotor Jr. No. 2.



FIG. 13.

This illustration accurately represents our new machine, the best all round spraying machine made, it was awarded first place at the Government spraying contest at Grimsby. It has all the patented improvements as described for the Spramotor Jr., and has been fully tested and approved. It will be found more convenient to attach to the barrel and can be arranged to attach to the side of the barrel, as shown, or by means of an additional pair of plates to the end, and may be ordered either way without extra charge. It will be found that the side of the barrel is very much the best way to attach. It is built low down and is the strongest machine ever placed on the market. All the working parts

are brass. It has our patent strainer, heavy base casting, patent detachable ball valves, patent automatic compensating plunger, and is arranged for one or two lines of hose. The above are all heavy brass. The plunger tube is No. 14 gauge seamless brass tube. The air chamber is of brass and extra large, and the machine is guaranteed the most effective of any machine of its capacity. It is fitted with our independent automatic dash agitator.



Fig. 14 shows the motor detached ready to agitate.

The plunger may be withdrawn in a moment to repack if desired. It is arranged for three lengths of stroke,  $3\frac{1}{2}$ ,  $4\frac{1}{2}$  and  $5\frac{1}{2}$  inches, thereby adjusting the capacity of the machine to the number of nozzles in use; will be found ample to operate 8 nozzles at one time.

One set of valves of our first construction has used over 1,000 bushels of lime whitewash, covering over 800 acres of surface. You can judge of their lasting quality. FOR PRICE LIST SEE NEXT PAGE.

There is nothing in America of equal capacity for double the money. All joints are threaded of uniform size, and are interchangeable with all pumps of this size.

It is especially designed to spray fruit trees, and is guaranteed to withstand the action

FIG. 14.

of, and successfully use Bordeaux mixture, whitewash and all spraying mixtures of whatever kind or consistency that can be acted upon with hydraulic machinery. It has been subject to the severest trials, and is a development and not an experiment.

Price complete, as shown, without accessories.. \$13.00

Price, all brass but plates and handle..... 16.00

Price of Outfits will range same as for No. 2 Spramotor. Above prices do no include accessories.

---

## **Spramotor Jr. Outfit 2=B.**

**For Low Spraying, Two Lines Hose.**

Spramotor Jr. No. 2, as described above, with two lines of hose, each 10 feet long with couplings attached, and two Spramotor nozzles.

Price complete, without barrel..... \$17.00

Extra, if all brass except handle and plates.... 3.00

---

## **Spramotor Jr. Outfit 2=C.**

**For Low Spraying, One Line Hose.**

Spramotor Jr. No. 2, as described above, with line of hose 10 feet long, with couplings attached, one Spramotor Y connection and two Spramotor nozzles.

Price complete, without barrel..... \$16.50

Extra, if all brass except handle and plates... 3.00

---

## **Spramotor Jr. Outfit 2=D.**

**For Low Spraying, Two Lines Hose.**

Spramotor Jr. No. 2, described on page 66, with two lines hose, each 10 feet long, with couplings attached, two Spramotor Y connections and four Spramotor nozzles.

Price complete, with four nozzles, without barrel \$20.00

Extra, if all brass except handle and plates.... 3.00





*"Every failing now is fatal, winners must be perfect."*

## Spramotor Jr. Outfit 2=E.

High Spraying, One Line Hose.

Spramotor No. 2, as described on page 66, with one line hose 10 feet long, couplings attached, brass hand-valve, 10-foot bamboo extension rod with brass cupped ends and drip guard, one Y connection and two Spramotor nozzles, without barrel.

Price, complete . . . \$20.00

Price complete, with 8-ft. iron extension rod, with patent drip guard . . . \$18.50

Extra, if all brass except handle and plates . . . \$3.

This is a most powerful outfit, it can be used as described or attached to a four or five row potato sprayer, and by its use 20 acres of potatoes can be sprayed in a day.

Complete formulas for painting and White-washing supplied to all purchasers of a Spramotor.

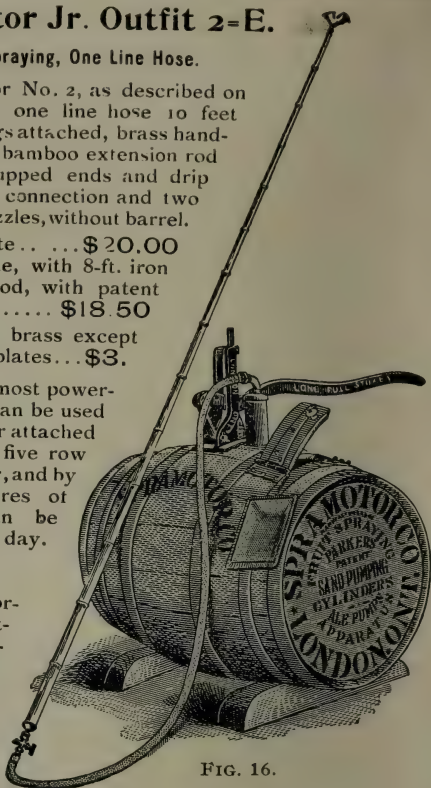


FIG. 16.

## Spramotor Outfit 2=F.

For High Spraying, 2000 Trees or Less, 2 Lines Hose.

Spramotor No. 2 (as described on page 66), with two lines of hose, each 10 feet long, with couplings attached, patent hand valves, two bamboo extension rods with internal brass tube, brass cupped ends and patent drip guard, two Y connections, four Spramotor nozzles.

Price complete with bamboo rods . . . \$27.00

Price complete, with iron extension rods and drip guards . . . 24.00

Extra, if all brass except handle and plates . . . 3.00

## Spramotor Outfit 2=G.

For Apple Spraying.

This outfit is our model outfit for No. 2 Spramotor ; it is in every way similar to our 2-E, with the difference that we have added our three-nozzle cluster connection and three Spramotor nozzles on the one extension rod instead of two, as outfit 2-E. The best results are made possible only by the use of this device, and we cannot too strongly recommend it to fruit growers as the best up-to-date apparatus for economy. This apparatus will repay its entire cost in one season on an orchard of 500 trees in saving of labor.

Price . . . \$21.10

With iron extension rod and patent drip guard . . 19.60

Extra, if all brass except handle and plates . . . 3.00

## Spramator Outfit 2-H.

For High Spraying; large  
enough for the largest  
orchard

This outfit is the same as  
our Model Outfit 2-G, but  
has two lines of hose, each  
10 feet, two patent hand  
valves, two bamboo ex-  
tension rods, two three-  
way connections, and six  
nozzles.

Price complete, \$29.20

Price with iron ex-  
tension rod and  
patent drip guard.....\$26.00  
Extra, if all brass except handles and plate..... 3.00

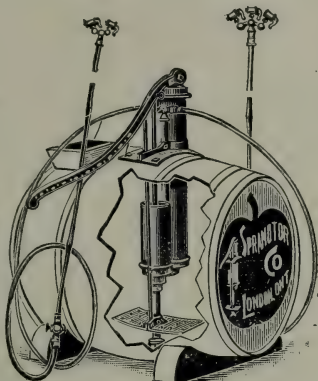


FIG. 19.

## Spramator Painting Nozzle.

(Patented)

After a year of careful experimenting, we offer to the  
public what we honestly believe to be the best nozzle for  
all purposes yet invented. It is made  
single or in clusters. There are no  
springs, nuts, screws or packing glands  
in this nozzle. It can be disgorge by a  
forward thrust, the cap moving back-  
ward unto the disgorge pin, the inter-  
nal pressure immediately forcing the  
movable cap forward, maintaining its  
proper position.

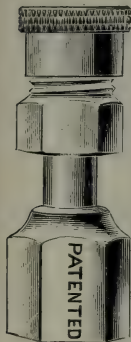


FIG. 57.

Warranted to apply oil and water  
paints, or to produce a better spray  
than is possible with any vermored nozzle.  
It weighs one-third the old style, and in  
clusters one-quarter. It is thoroughly  
well made and is durable.

When sold in clusters, will be sup-  
plied with our Patent Drip Guard, without  
extra charge.

Will be supplied with hardened steel  
interchangeable disks, when used for painting purposes,  
without extra charge.



FIG. 58.



FIG. 59.

Single nozzles as shown, by mail. .... \$0.80  
Two-cluster, with Patent Drip Guard, by mail.. 2.00  
Three-cluster, " " " " .. 2.90

## Painting Nozzles.

This illustration shows our new Painting and Spraying Nozzle. The greatest care is taken in its construction, and it is the best value yet put on the market. The spray is forced, and it is warranted to give perfect satisfaction for the very finest vapor spray in a bush farm, and is unexcelled for painting, whitewashing or spraying of mechanical emulsion or pure oil for scale parasites. It is provided with disgorger, and can be cleaned in a moment.



FIG. 42.

Price, by mail..... 80c.

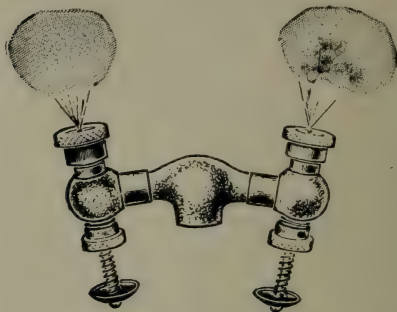


FIG. 43

The cluster as shown is what some orchardists demand for spraying apple trees, particularly for kerosene emulsion and pure kerosene, and is complete with connection as illustrated.

Price...\$2.00

This cluster is the best that can be devised for spraying large work where this type of nozzle is required for fineness and form of spray

Price, complete, as shown, having three nozzles and connection.....\$2.70

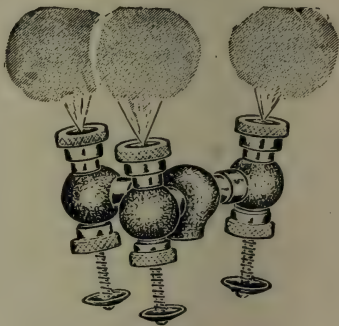


FIG. 44.

## The Spramotor Improved Nozzle.

With Lance Stop-cock and Disgorger.

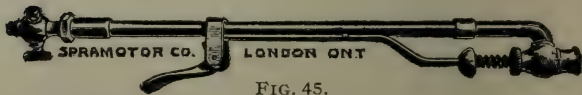


FIG. 45.

This Lance and Nozzle is about eighteen inches long and provided with a Degorger, operated by means of a lever and spring working through guides, a stop-cock at the end of the nozzle, to which hose is attached, may be used to control the spray and shut off the supply, therefore saving loss of mixture. This nozzle is especially designed to be used with our **No. 1 SPRAMOTOR** or **KNAPSACK SPRAMOTOR**. It is sold to fit any of our Spramotors, but usually fitted for half-inch hose, the same as our hose couplings.

Price ..... \$2.50

## Spramotor Nozzles.

Important improvements have been made this year in nozzles, thereby making them better and lighter, so that

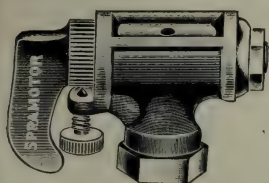


FIG. 39.

three can be placed upon the end of a 10-foot bamboo extension, and the weight is not more than two would be formerly. This (the Spramotor) nozzle has advantages not possessed by any other style. The spray can be graduated to suit the work in hand, from smallest fan-shaped spray up to the extreme limit of the

nozzle, being throughout its range the very finest vapor spray. It can be disgorged in an instant by reversing the handle. It is not easily stopped up like the Vermorel, and with reasonable care one can spray without disgorging at all. Another great advantage it possesses over other types is that it can be regulated for close, fine spraying or extremely high spraying, up to 15 feet from the nozzle. In fact it can be regulated from the smallest and finest vapor to a coarse spray or solid stream.

Spramotor or nozzles have double angle for spray and will be found to meet all requirements for all tree spraying. Price each..... 75c.

### TWO-NOZZLE CLUSTER

Our two-nozzle cluster is adapted for multiplying the sprays and economizing time and labor, and is designed to go on the top of any of our extension rods.

Price complete, as shown..\$2.00



FIG. 40.

### THREE-NOZZLE CLUSTER.

This device was designed to economize labor in applying the various mixtures. One third less time is required by its use. With this connection placed on the upper end of the extension rod, and three Spramotor nozzles, it is possible to do the greatest amount of spraying that can be done with two operators — one to pump

and one to manage the pole. All the nozzles are governed by the cock at the lower end of the extension rod, thereby giving the operator perfect control of the pressure. Each nozzle being separately adjusted the greatest facility is given the operator, as one nozzle can be set for the higher work while the other two are adjusted for wider and lower spraying, thereby increasing the surface covered.

Price, each..... \$2.85

### DOMINION OF CANADA, DEPT. OF AGRICULTURE.

Central Experimental Farm, Ottawa, Feb. 11th, 1902.

F. Larkin, Esq., North Salt Spring, B.C.

Dear Sir: Your letter of 3rd inst received. The best spray pump we have tried here is that made by the Spramotor Co., London, Ont. They manufacture barrel pumps with one or two lines of hose. If you have a large orchard, it would pay you best to get that with the two lines of hose. By writing to the firm for their illustrated catalogue, you would get their prices and descriptions of pumps.

Yours truly, W. T. MACOUN, Horticulturist.



## Y Connection.

By the addition of our interchangeable brass "Y" connection two or three nozzles can be placed on the end of the hose or bamboo extension rod, whereby one man can do the work of two at the small additional cost of one nozzle and a "Y" connection. This method of duplication is original with us and will be found a wonderful improvement over the old single-nozzle plan.



FIG. 46. Price, each..... 60c.

One of the most important features of the two nozzles and the extension plan is that the vapor spray (which is the only kind of spray that should be used) can be applied right where it is required. The antiquated style of standing on the ground and deluging the trees with the mixture is very wasteful, and is not nearly so effective. Vapor spraying of course, cannot be done with the old style nozzles and pumps. We can now do it with an eight-year old boy at the handle.



FIG. 47.

Price, with two outlets ..... 50c.

Price, with three outlets as shown ..... 60c.

## Bamboo Extension Rods.



Our Bamboo Extension Rod is as nearly perfection, for the purpose intended as anything can well be. No iron is used in its construction, the seamless tube extending inside the bamboo being of brass, with brass connections at the ends, interchangeable with other sizes, will be made eight or 10 feet long, other lengths to order.

We have invented a combination of water drip guard and end, and which is on all our extension rods, thereby preventing any drip from the nozzles from running down the bamboo pole on to the operator's hands.

Men who have been in the habit of using the cheap leaky, nasty pumps, and appliances in such common use, can hardly imagine that it is possible to do more work in the same time, use less material, and hardly soil the hands, much less being drenched to the skin, as in the past; but it is a fact, and the expense is very small. No person who has seen this would be without it

FIG. 48 at three times the cost.



FIG. 49

Price, bamboo rod, 8 or 10 feet, with drip guard. . \$2.50

Price, 10 ft. bamboo extension rod with drip guard, two-nozzle cluster and Pat. hand valve attached. Complete (Fig. 49)..... \$5.50

Listowel, August 11th, 1900.

Messrs. Spramotor Co. London, Ont.:

Gentlemen:—This is to certify that we have had our Gas Works whitewashed by R. E. Hemphill, of this town, by one of your Spramotors, and the work has been done to our satisfaction, and very much cheaper than it could be done by any other process we know of.

Listowel Gas & Electric Light Co. Limited.

Per JOHN C. HAY.

## Iron Extension Pipe.

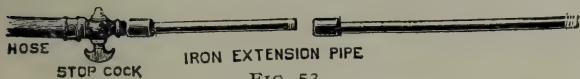


FIG. 53.

Our new Iron Extension Pipe is made in lengths to suit purchasers—either six or eight feet. They are good and serviceable ; the most serious objection is their smallness, causing the hands to cramp when using them for an extended period. They lack the stiffness and durability of the bamboo, but will be desired by many owing to the difference in price..... **60c.**

## Drip Guard ( Patented ).

This useful device is a complete protection to the operator against any drip running down the extension rod, and is another evidence of the Spramotor Co.'s foresight in providing all the necessary qualifications in their spraying apparatus. It is placed just below the nozzle or cluster of nozzles, whereby all the drip is run off. The bamboo extension pipes made by the Spramotor Co. have the drip guard without extra charge, and it is included on all their iron extension pipes as described in the various outfits, or is sold separately for **40c.** each.



FIG. 60.

## Spramotor Hand Valve.

Pat. in Canada and U. S.

Great complaints have been made by spraying operators against the stopcock supplied with spraying equipments, and as the difficulty cannot be overcome with stopcocks, the Spramotor Co. have perfected a new and novel self-closing valve that is illustrated herein. This valve can be instantly closed or opened by a simple pressure of the hand, is packed and closed by spring pressure, is made of brass, carefully made, and it has one great advantage over stopcocks, it will not leak through the nozzle or through the packing. It can be opened or closed with one hand while pumping with the other hand. By its use the hands are kept dry. For whitewashing or painting work it is invaluable, and will last longer than a dozen stopcocks.



FIG. 52.

Price.....**\$1.00**

London, Ont., Feb. 17th, 1898.

Spramotor Co., London, Ont.:

Dear Sirs,--In answer to yours of the 16th inst. I can say I find it takes two men to handle your Spramotor, but two men can do as much work with it as four men working the old way with hand whitewash brushes, and with the Spramotor we can whitewash corners and cracks in the timbers and high awkward places which we could not get at in the old way.

Yours truly, JOHN LABATT.

## Brass Row and Mustard Sprayers.



FIG. 61.

To fill a growing demand for an all-brass, adjustable Row Sprayer, or for the spraying of mustard and general field work, the Spramotor Co. have constructed a series of sprayers made entirely of brass for use with our nozzles at a price exceedingly low. They are adjustable from 26 in. to 36 in., and are arranged to attach to our special Spramotor Vermorel nozzles. These Row Sprayers may be used for a variety of purposes, and being entirely of brass, are not affected by the action of the various chemicals used.

### PRICES:

Two rows, without nozzles, \$2.00, with nozzles, \$3.20

Extreme width of spray, 7 feet.

Three rows, without nozzles, \$2.50, with nozzles, \$4.30

Extreme width of spray, 10 feet.

Four rows, without nozzles, \$3.50, with nozzles, \$5.90

Extreme width of spray, 13 feet.

Five rows, without nozzles, \$4.50, with nozzles, \$7.50

Extreme width of spray, 16 feet.

Price of wider sprayers at same proportion.

Prices of nozzles for the above if sold with sprayers 60c. each. Our regular nozzles may be used, and if so required add 5 cents per row for attachment.

For mustard spraying one of our No. 1 or No. 2 Spramotors with a 4 or 5 row sprayer will cover from 13 to 16 feet as fast as a horse can walk. A convenient form is to attach to the rear of a wide axled cart. The greatest amount of surface may be covered effectively. Prices will be given for complete outfit, cart and all, on application.

## Iron Row Sprayers.



FIG. 24.

For spraying all low lying plants, such as potatoes, strawberries. It can be used with any of our nozzles. This device can be attached to the back of any cart or wagon, and being supplied by any of our Spramotors, all low lying bushes, grape vines, potatoes and turnips can be sprayed two or three rows at a time, requiring only one operator to drive the horse and work the pump. This is a wonderful saving in labor over any device so far in the market. The iron row sprayers are not adjustable, but are made for width of row as ordered.

### PRICES:

Two rows, without nozzles, \$1.00, with nozzles, \$2 50

Three     "     "     1.50,     "     3.75

Four     "     "     2.00,     "     5.00

Five     "     "     2.50,     "     6.25

*"Quick witted Jacks are always ahead of slow witted giants."*

## Spramotor Lance.

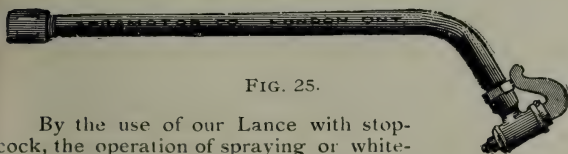


FIG. 25.

By the use of our Lance with stop-cock, the operation of spraying or white-washing can be done without soiling the hands, as the nozzle, by its aid, is placed a foot or more away from the operator's hands.

As illustrated, with nozzle and iron lance, 12 to 18 ins. long..... 95c.  
In brass, 12 to 15 ins. long, without nozzle..... 50c.

## Automatic Adjuster.



FIG. 26.

Any of our regular Spramotors are guaranteed to do whitewashing. We advise, however, that our improved Vermorel nozzle, and our Spramotor automatic adjuster be used, a device specially designed to control the position and hold the nozzle at any desired angle, especially useful for walls and ceiling work.

Price (three feet long, all brass) as illustrated.... \$3.00

## Stop Cocks.

We manufacture Stop-cocks of two sizes, one that is intended to attach to the pump, being under control of the operator of the pump, the other for tree work, that is placed at the lower



FIG. 50.

end of the extension rod. No outfit should be without one or both of these, for by the use of them the operator has full control of the mixture, thereby preventing waste, as well as perfect command of pressure. Price..... 75c.

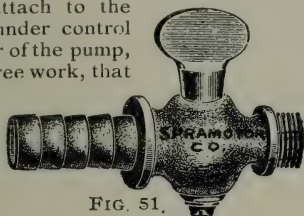


FIG. 51.

## Hose Couplings.

Hose Couplings used by us on all our different apparatus are interchangeable with one or other of these styles, and care should be taken to order them by figure, as some are particular which they have.

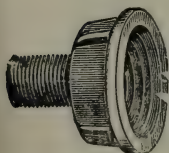


FIG. 54.

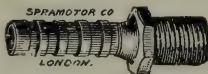


FIG. 55.

Price ..... 20c.

"There is no pension paid for worn out brains." No, nor for worn out pumps. If you don't want to have both, buy a Spramotor. You never saw or heard of one worn out.





SPRAYING POTATOES WITH THE SPRAMOTOR KNAPSACK.

## Hose.

The quality and price of Hose varies so considerable we have concluded to allow the buyer to take his own selection in grade and length, so have listed it separately. The common practice of placing from three to eight feet



FIG. 56.

of hose to a spray equipment will not satisfy experienced men. Our own opinion is that 25 feet for each line is about right, and no line of hose is complete for any class of work with-

out a stopcock, and for tree work an extension rod as well. Our price for hose includes one set of couplings and connections, being properly fitted ready for use. The lasting quality of hose depends upon the number of ply of cotton and the purity of the rubber used in its make-up. Nothing less than three-ply standard quality will stand the pressure developed by the Spramotor.

Hose for Spramotor Knapsack will be  $\frac{1}{4}$ -inch heavy ; No. O Spramotor outfits for spraying purposes,  $\frac{1}{2}$ -inch 3-ply ; for oil spraying,  $\frac{3}{8}$  or  $\frac{1}{4}$ -inch ; all others,  $\frac{1}{2}$ -inch 3-ply.

$\frac{1}{2}$ -inch 3-ply standard quality will be sent unless otherwise ordered. Those who require extra quality can be supplied with  $\frac{1}{2}$ -inch 3-ply at 2c. per foot extra, or in 4-ply, extra quality, at 4c. per foot extra.

Price complete for  $\frac{1}{2}$ -inch 3-ply hose, including couplings, in 10-foot lengths or over, net per foot. 10c.

Price  $\frac{1}{2}$ -inch 3-ply, extra quality, per foot.....12c.

“ “ 4-ply “ “ “ .....14c.

**PAINT CATALOGUE**—Our Special Paint Catalogue will be mailed free to all, on request, who are interested in the subject.

Spramotor Co., London, Ont,

Dear Sirs, - I am pleased to state that in five years use the Spramotor has not cost a cent for repairs, except one packing.

We remain, yours truly, ALF. BROWN.

## How to Fit a Barrel.

---

We supply templets to cut openings by, and if the directions are followed you can fit your barrel just as well as necessary. We will supply barrel to all who require it properly fitted with pump placed ready for work.

Price net, oak barrels .....\$2.50

Get two supports 4 x 4 inches and 24 inches long, and form them, as shown, to fit the round of the barrel and screw them securely to the barrel. Then cut the opening by the paper templets, as supplied with each Spramotor. Take a 4 x 8 T hinge and after cutting one end of the opening over which hinge works (the T end of the hinge), then bend the hinge to the form of the barrel and screw it in place; complete the cutting of the sides and end and the hinge will act as a support for the cover of the opening; screw on a handle to open the door by and you are all right. A few wire nails dowed into the edges of the staves, where they are cut, will make them hold their places and make a lasting job.

**Screen.**—We supply a hardwood hopper and brass screen through which the mixture is poured and strained as it is put into the barrel .....Price 50c.

---



THE APPLICATION OF WHITEWASH TO THE OUTSIDE OF A BRICK BUILDING, WHICH IS DONE BETTER AND FASTER THAN TWENTY MEN WITH BRUSHES.

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Every process in building the Spramotor is under the most careful system of testing and inspection, insuring uniformity.

## The Famous Spray Pump Contest.

---

The following circular was received by the Spramotor Co., which explains itself:

*To all Manufacturers of Spraying Pumps:*

Dear Sir,—The Board of Control of the Fruit Experiment Stations of Ontario have decided to invite a public trial of spray pumps, to be held at Grimsby on Thursday, April 2nd, 1896, commencing at 10 o'clock a.m. All manufacturers who desire to enter the trial will kindly notify the director of the spraying experiments, Mr. A. H. Pettit, Grimsby, not later than March 25th.

It is intended that this trial shall be of a thorough and practical character. Exhibitors will be furnished with four pounds of copper sulphate, four pounds of lime and four ounces of Paris green, which will constitute 50 gallons when diluted, to be applied to orchard trees in sufficient quantity and not extravagantly. The points to be taken into consideration will be left to the discretion of the judges, and we trust their report as to the efficiency of the pumps exhibited will be freely accepted by the manufacturers exhibiting, and also by the fruit growers of Ontario, as a satisfactory answer to the numerous inquiries continually being made as to which spray pump is most desirable for general use.

L. WOOLVERTON, Secretary Board of Control.

---

*(Extract from "Canadian Horticulturist.")*

The illustration on the following page is a little snapshot of the camera, showing a novel and unique pump exhibit, the first of the kind ever held, so far as we are aware, in the world. The importance of spraying our fruit orchards and gardens having been so plainly demonstrated to the public by the Department of Agriculture of Ontario, through Mr. A. H. Pettit, director of the spraying experiments, the Board of Control shouldered the responsibility of testing and reporting upon the merits of the various spraying pumps, all of which claim to hold the highest place.

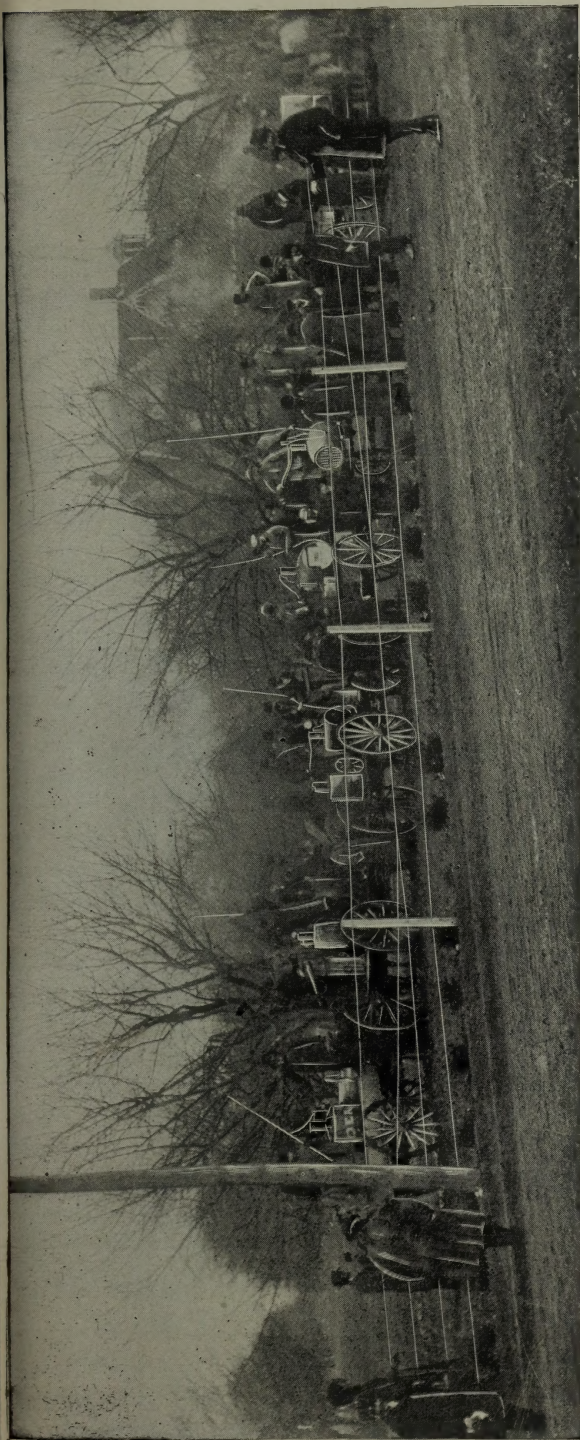
The judges were H. L. Hutt, B.S.A., Guelph, and Mr. M. Pettit, our President. The appointed day—Thursday, April 2nd—was a cold stormy day, and yet the trial proceeded. There were eleven exhibitors, and eleven rows of apple trees in Mr. E. J. Woolverton's orchard were selected. Each man drew his number of row, mixed his Bordeaux and proceeded in order to the orchard, followed by the judges and an interested crowd of fruit growers. Each exhibitor had to put his pump to a practical test by applying about 40 gallons of the mixture to the orchard. The second day each exhibitor was required to take his pump in parts for the information of the judges.

---

*(Extract from the Annual Report of the President of the Fruit Growers' Association of Ontario, 1896, page 5.)*

Great improvements have been made by the manufacturers of spraying outfits, and in answer to the numerous enquiries continually being made as to which spraying pump was the most suitable for general use, the Board of Control of the fruit experimental stations of Ontario decided to invite a public trial of spray pumps, which was held last April, at Grimsby, the Judges awarded **The Spramotor, of London, Ont., FIRST PLACE.**





**Government Spraying Contest at Grimsby** { Ideal 6th Reid's 9th Clarksburg 5th Empire King 7th Rotary 11th Aylmer 3rd Pomona 4th **SPRAMOTOR FIRST** Defender 10th Gem 8th Eclipse 11th 2nd



## Discount to Agents.

We give a discount to agents who buy in quantity.

We believe it costs us three times as much to manufacture our Spramotor as it does the cheaply made iron goods now in the market. Yet we believe more money can be made with our goods, as they are well made and have many advantages over others.

They are ready sellers. We do not give a discount with the first outfit. Too many have asked this with a view to supplying their own wants, and then forget about the agency.

The Spramotor is not a cheaply made machine, like too many on the market. Iron contraptions are manufactured at a very low price. The working parts alone are of brass. Ask the makers what they would charge for a well-made machine like the Spramotor, and they will give you figures far and above those asked for the Spramotor.

Send your orders to us in time. Do not delay until the last moment. You may be disappointed—hundreds are every year. The Spramotor cannot be made on short notice. It is only done by the greatest care, and we require time to do it.

SEND US YOUR ORDER IMMEDIATELY with 25 per cent. of the amount of order, stating when you want the outfit. Remit the balance at the time, and we will have the machine ready for you. This gives us an opportunity to thoroughly test the apparatus before shipping to you.

CREDIT AND STANDING. Nearly all our customers are perfectly good; at the same time we have no way of knowing it, nor have we the time to make enquiry to find out. You can have ample opportunity to examine the outfit at the railway station or express office, and if satisfied, you are well protected in our signed guarantee, which should be on your order.

NAME AND ADDRESS. Be sure and write your name and address plain, giving post office, county and province to all letters and orders. We often receive letters unsigned, and therefore cannot reply to them for want of this.

MAKE ORDERS BRIEF. Do not make orders out in the middle of a long letter. Make your orders out on blank enclosed. If you want to write do so on a separate sheet. Order by number and letter and save the possibility of mistakes.

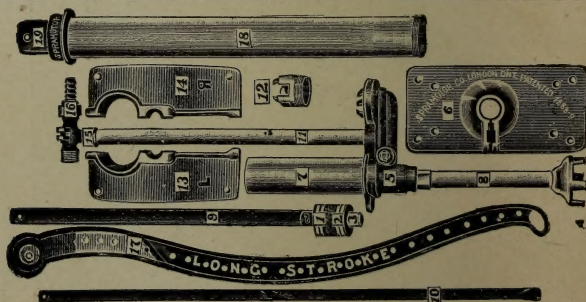
## Repairs.

### SPRAMOTOR JR.

No. PART	NAME OF PART.	No. 0	No. 1	No. 2
1	Upper Half Plunger	\$ .40	\$ .60	\$ .80
2	Low'r Half Plunger	.30	.40	.60
3	Plunger Nut	.10	.15	.15
4	Strainer	.40	.60	.60
5	Base Casting	.90	1.80	2.25
6	Agitator	.60	.50	.50
7	Plunger Tube	.60	.80	1.00
8	Suction Tube	.25	.30	.30
9	Plunger Rod	.25	.30	.30
10	Agitator Rod	.25	.30	.30
11	Discharge Tube	.50	1.00	1.00
12	Valve, Cage	.50	1.00	1.00
13	Left Half Clamp	.30	.50	.70
14	Right Half Clamp	.30	.50	.70
15	Discharge T.	.15	.50	.50
16	Hose Coupling	.20	.20	.20
17	Handle	.40	.75	1.00
18	Air Chamber Tube	.40	.60	1.50
19	Air Chamber Cap.	.25	.40	.50

### SPRAMOTORS.

No. PART	NAME OF PART.	No. 1	No. 2
1	Head and Guide	\$1.00	\$1.50
2	Plunger Tube	.80	1.00
3	Air Chamber	2.70	3.25
4	Plunger	1.00	1.50
5	Base Casting	1.50	2.00
6	Agitator Casting	.50	.50
7	Brass Strainer	.60	.60
8	Suction Tube	.30	.30
9	Plunger Rod	.25	.30
10	Agitator Rod	.25	.25
12	Valve, Cage and Detach Seat	1.00	1.00
13	Hose Couplings	.20	.20
14	Link	.25	.25
15	Link Bolt	.04	.05
16	Plunger Bolt	.05	.05
17	Handle	.60	.70
...	...	...	...
...	...	...	...



# CULTIVATION, FERTILIZATION, AND SPRAYING:

THE ORTHODOX TRINITY OF SUCCESSFUL FRUIT GROWING.

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# A GOLD MINE ON YOUR FARM



SPRAMOTON  
Co.  
LONDON